

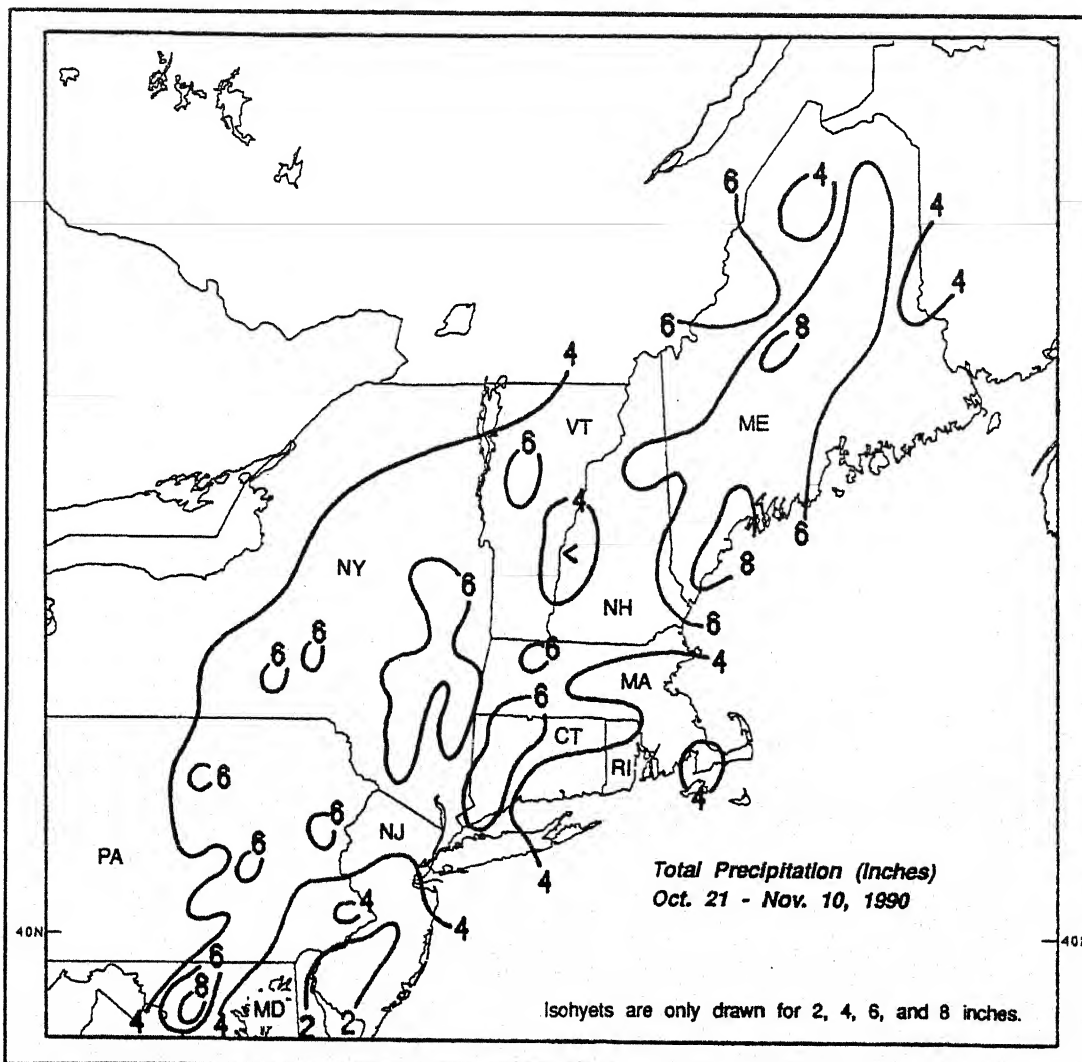
CONTAINS:
OCTOBER 1990
UNITED
STATES
CLIMATE
SUMMARY

WEEKLY CLIMATE BULLETIN

No. 90/45

Washington, DC

November 10, 1990



During two of the past three weeks, strong storm systems have dropped between 4 and 10 inches of precipitation on most of the Northeast, continuing this year's wet weather trend in the region. The first ten months of 1990 have been the second wettest such period in the eleven state region since records began in 18

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE-NATIONAL METEOROLOGICAL CE
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- *Highlights of major climatic events and anomalies.*
- *U.S. climatic conditions for the previous week.*
- *U.S. apparent temperatures (summer) or wind chill (winter).*
- *U.S. cooling degree days (summer) or heating degree days (winter).*
- *Global two-week temperature anomalies.*
- *Global four-week precipitation anomalies.*
- *Global monthly temperature and precipitation anomalies.*
- *Global three-month precipitation anomalies (once a month).*
- *Global twelve-month precipitation anomalies (every three months).*
- *Global three-month temperature anomalies for winter and summer seasons.*
- *Special climate summaries, explanations, etc. (as appropriate).*

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF NOVEMBER 10, 1990

1. The Southeastern U.S. and Bahamas:

MODERATE RAINS SOAK MUCH OF REGION.

A strong storm system brought copious rains to the Southeast and Bahamas, with isolated incidents of severe weather and flooding. Between 40–115 mm soaked areas from the Tennessee Valley southwestward through the lower Missouri Valley as well as along the Atlantic Coast. Most of the Southeast and Bahamas recorded 25–65 mm, although most of Florida measured only 8–30 mm. Most locations report short-term precipitation surpluses which reached 370 mm since early October in northeastern Georgia. Long-term drought conditions persisted, however, across southern Georgia and most of Florida [Ended after 32 weeks].

2. South-Central Europe and North-Central Africa:

ABOVE NORMAL TEMPERATURES PERSIST.

South-central sections of Europe experienced temperatures 2°C to 4°C above normal while weekly departures reached +7°C in northern Libya, where summer-like weather continued. Highs approached 41°C in portions of Algeria [8 weeks].

3. Central and Western Sahel:

HOT WEATHER PREVAILS AGAIN.

Weekly temperature departures remained around +2°C or +3°C [13 weeks].

4. Southeastern Africa

RAINY SEASON STARTS SLOWLY.

During the past 5 weeks, deficient rainfall has prevailed during what is normally the start of the rainy season. Only 0–60 mm has dampened the region since early October, with slightly higher amounts in the Transvaal (typically, 25–125 mm should have fallen). Little or no rain was reported again last week, although isolated totals of 20–59 mm moistened parts of the Transvaal [6 weeks].

5. Southeastern India and Sri Lanka:

RAINFALL FINALLY ABATES.

Little or no rain fell throughout southern India and northern and eastern Sri Lanka while only 30–50 mm dampened western and

southern portions of Sri Lanka. During the previous three weeks, much of coastal southeastern India measured up to 395 mm above normal rainfall while surpluses across the remainder of southern India and Sri Lanka ranged up to 90 mm [Ended after 4 weeks].

6. Northeastern China and North Korea:

LIGHT PRECIPITATION AND LOW NORMALS BRING AN END TO MOISTURE DEFICITS.

Light precipitation (10–45 mm) across southern and eastern parts of the region combined with lowering normals area-wide, bringing an end to the dry spell [Ended after 6 weeks].

7. Japan:

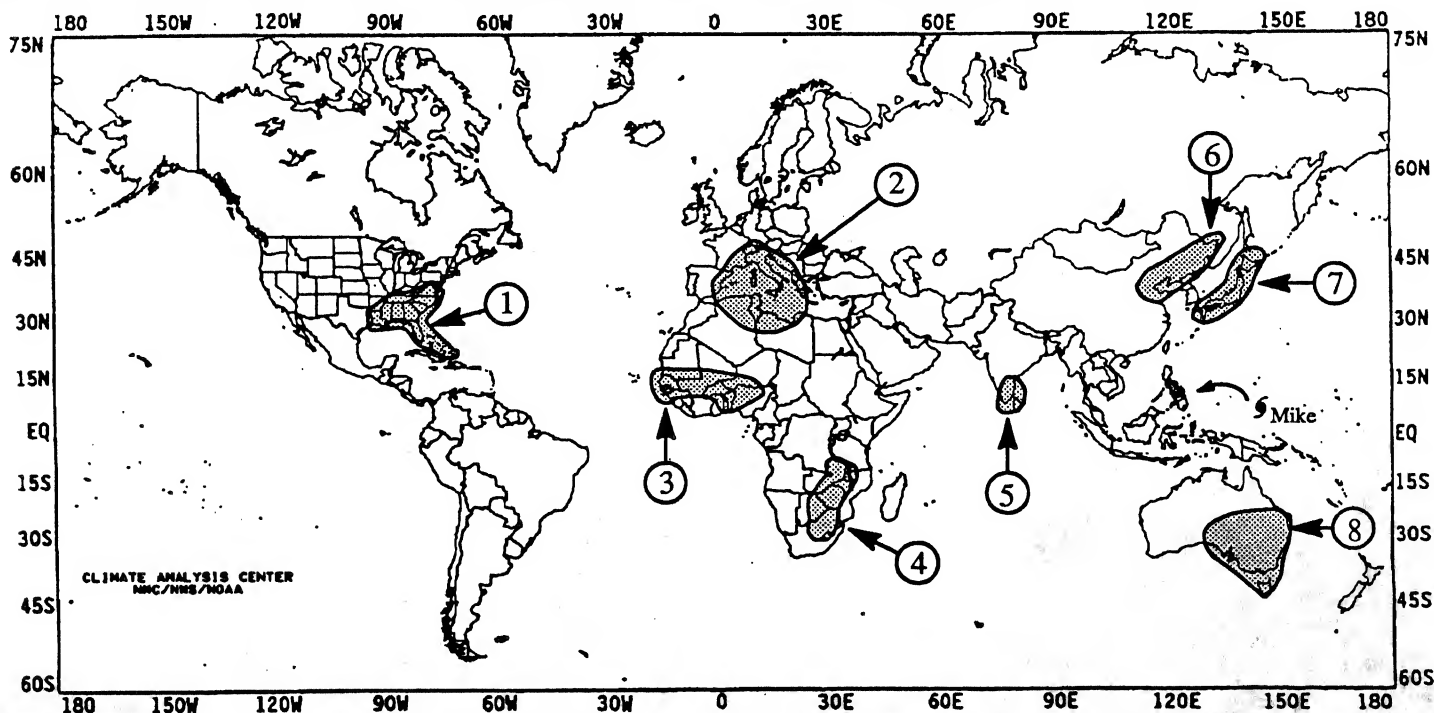
HEAVY RAINS SOAK THE ISLANDS WHILE EXCEPTIONAL WARMTH REDEVELOPS.

30–80 mm of rain soaked most of Japan, with scattered locations reporting 100–240 mm. According to press reports, several individuals lost their lives in flooding and landslides, particularly in northern Honshu and Hokkaido, as daily rainfall totals reached 170 mm. Since the end of September, much of Japan has measured 60–150 mm of extra rainfall, with surpluses approaching 345 mm in isolated portions of Honshu [Wet – 8 weeks]. In addition, unusually high temperatures again afflicted the Islands, with weekly departures of +3°C to +5°C [Warm – 13 weeks].

8. Southeastern Australia:

HOT, DRY WEATHER PERSISTS.

Light rain (20–40 mm) fell across Victoria and Tasmania, but little or no rain was measured elsewhere. Since mid-Spring, rainfall deficits of 50–70 mm have accumulated along coastal Victoria and New South Wales [Dry – 5 weeks]. Hot weather also continued, particularly across interior New South Wales, South Australia, and Queensland, where departures between +3°C and +6°C and highs near 41°C were reported [Warm – 3 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF NOVEMBER 4 THROUGH NOVEMBER 10, 1990.

The first full week of November provided much of the country with winter-like weather. Early in the week, a major storm system formed in the central Rockies and moved through the central Plains and middle Mississippi Valley, dumping heavy rain and snow across much of the region. Three feet of snow buried Casper Mountain, WY, and portions of northwestern Missouri were blanketed with over 6 inches. The storm eventually moved northeastward across the Great Lakes region, dumping up to a foot of snow on northern Michigan and parts of western New England. Moderate to heavy rain fell across the central Great Lakes and western Ohio Valley, causing minor flooding in parts of Indiana and Michigan. Behind the storm system, cold Canadian air moved into the central U.S. and produced record low temperatures from Wyoming to Iowa. Later in the week, another storm system organized over the southern Great Plains, producing heavy rains that flooded parts of eastern Texas. The system also dumped heavy rains on the Southeast and spawned a few tornadoes in Florida and North Carolina's Outer Banks. The storm eventually trekked up the Eastern Seaboard, soaking the mid-Atlantic and Northeast with a couple inches of rain. In western New England, the rain changed to snow where up to a foot was measured. Farther west, heavy rains and high winds pounded parts of the Pacific Northwest. Flooding was reported in western Washington where nearly 12 inches of rain fell. Record low temperatures and high winds dominated much of Alaska where readings dropped below -40°F . In contrast, Kahului, HI reached 3°F on Thursday, tying the record high for the date.

The week began with a low pressure system in the central U.S. and a cold front trailing through the lower Mississippi Valley. The storm system brought the season's first snowfall to parts of the central Great Plains and middle Mississippi Valley. Cold air invaded the nation's midsection behind the system, dropping temperatures into the single digits. Ahead of the front, warm weather prevailed with highs in the lower eighties across much of the Southeast. As the storm system moved rapidly northeastward into Canada, high winds in excess of 60 mph were measured across the upper Great Lakes and northern New England. Visibilities dropped to near zero due to blowing snow, and wind chills below -20°F were produced in western New York. Meanwhile, heavy rains fell across the central Great Lakes and lower Midwest. Farther west, an upper-level disturbance brought heavy snow to the southern half of the Rockies where parts of southwestern Colorado measured as much as 19

inches. The disturbance moved southeastward into Texas, dumping up to 4 inches of rain on eastern portions of the state.

During the latter half of the week, the aforementioned system tracked into the Southeast and then northeastward up the Atlantic Coast. Strong thunderstorms produced heavy rains and localized flooding in parts of Florida. Jacksonville, FL reported waist-high waters on some roads. Towards the weekend, heavy rains fell across the mid-Atlantic and eastern New England while heavy snow whitened the northern Appalachians. Heavy precipitation also occurred in the Pacific Northwest as a strong storm system moved onshore. Many rivers in western Washington were at or above flood stage.

According to the River Forecast Centers, the greatest weekly precipitation (more than 3 inches) was observed along the Pacific Northwest Coast, in the northern Cascades, southern Great Plains, lower Mississippi and western Tennessee Valleys, and the Northeast (Table 1). Scattered heavy amounts were found across the mid-Atlantic, central Great Lakes, and along the southern Atlantic and central Gulf Coasts. Light to moderate amounts were recorded in the Pacific Northwest, most of the Rockies, the southern two-thirds of the Plains, and the eastern half of the nation. Little or no precipitation was observed in the remainder of the country west of the Rockies, the south-central High Plains, and the northern Great Plains and upper Midwest.

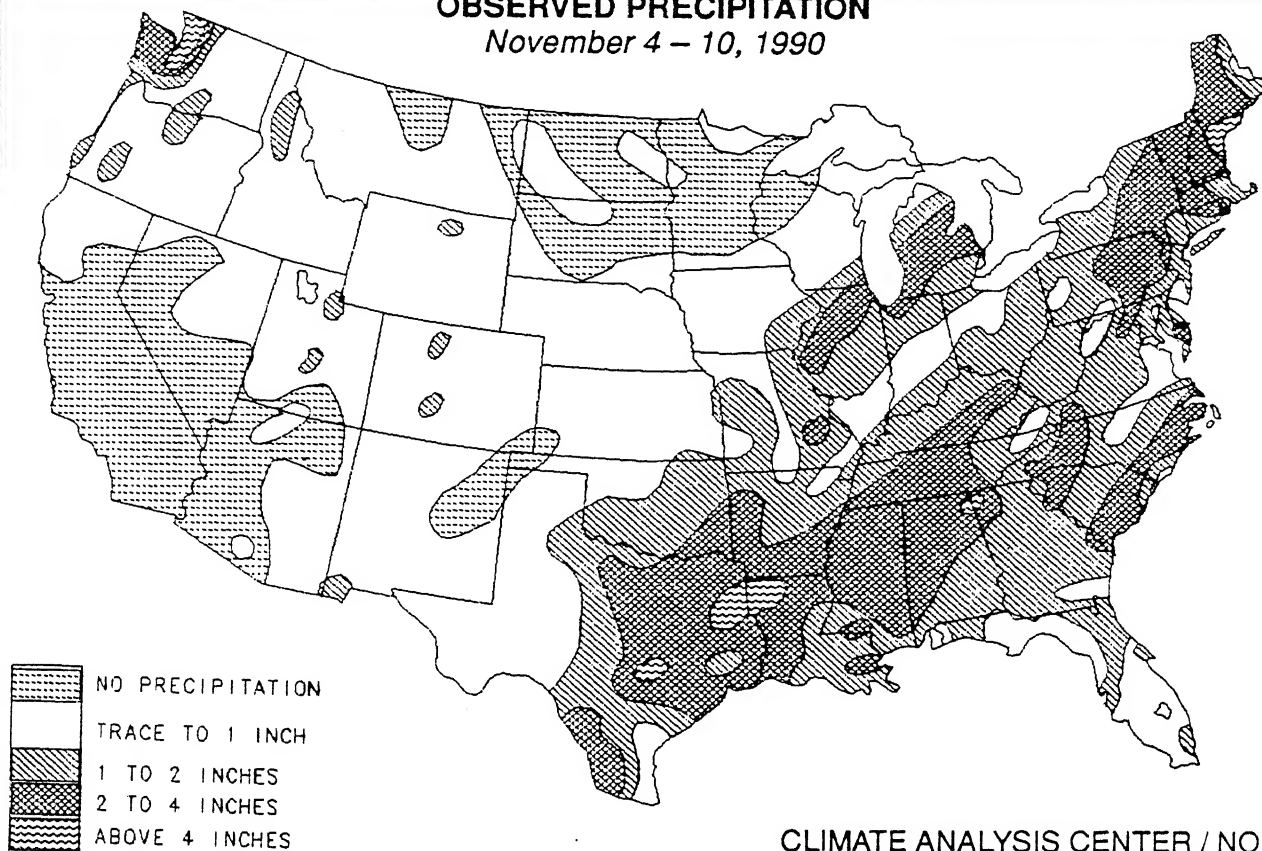
Above normal temperatures were confined to the southern Atlantic Coast states, along the Pacific Coast, in extreme northern Alaska, and Hawaii. In the lower 48 states, the greatest departures (more than $+4^{\circ}\text{F}$) were found in western Oregon and Washington and at a few locations in central Florida (Table 2). Early in the week, however, Indian Summer weather pushed temperatures into the seventies as far north as northeastern Maine, and Santa Ana winds sent readings into the nineties along coastal sections of southern California on Saturday (Figure 1).

In contrast, cold weather prevailed throughout the nation's midsection during most of the week. Temperatures averaged as much as 11°F below normal in the central Great Plains where lows dipped into the single digits (Table 3). Subzero readings occurred in portions of the central and northern Rockies. Farther north, bitterly cold conditions were reported in most of Alaska where temperatures plunged to -44°F at Northway, and many stations recorded weekly departures of -5°F to -15°F .

TABLE 1. Selected stations with 3.00 or more inches of precipitation for the week.

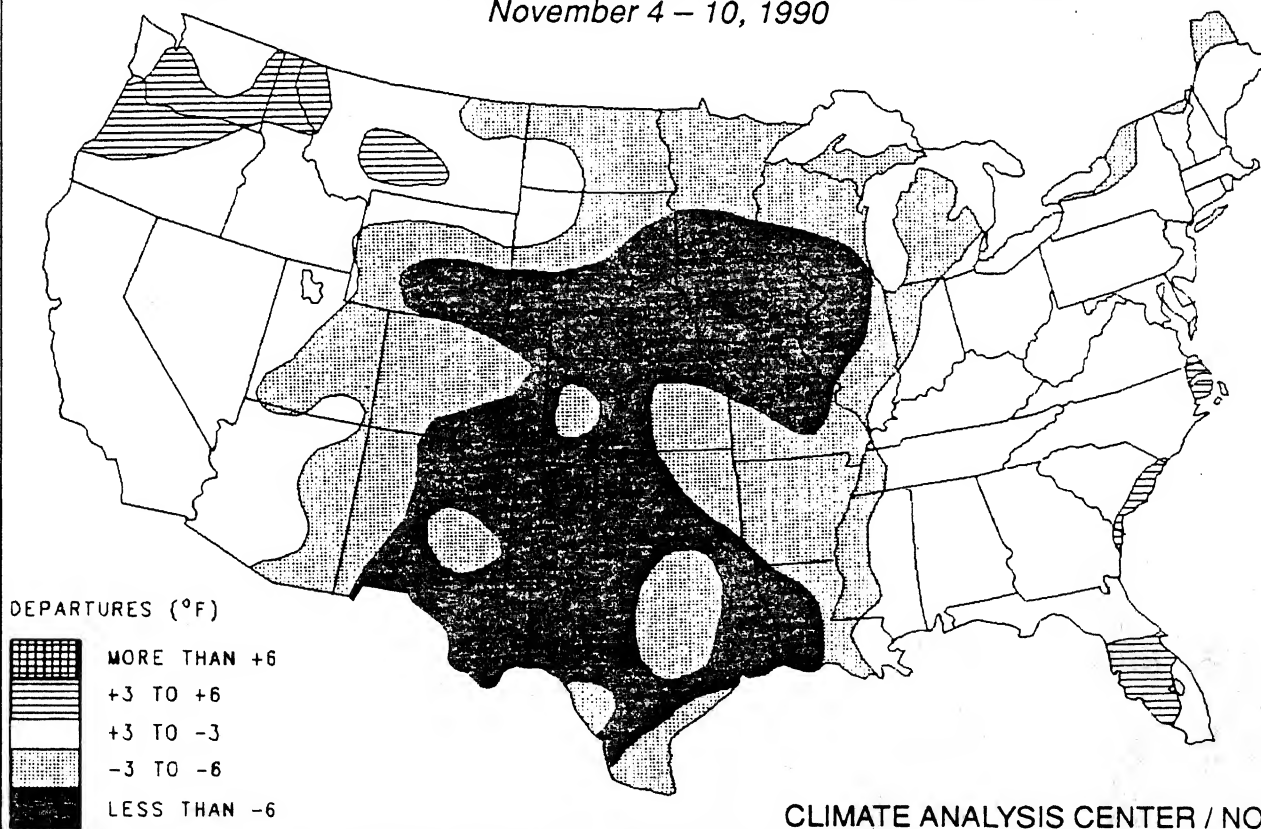
STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
STAMPEDE PASS, WA	8.42	CHARLESTON, SC	3.55
HILO/LYMAN, HAWAII, HI	7.36	AUGUSTA, ME	3.53
PORTLAND, ME	6.60	MONROE, LA	3.51
QUILLAYUTE, WA	5.55	AUSTIN, TX	3.43
SHREVEPORT, LA	5.03	KEY WEST NAS, FL	3.38
BRUNSWICK NAS, ME	5.00	NEW BERN, NC	3.37
BELLINGHAM, WA	4.69	MERIDIAN, MS	3.32
SHREVEPORT/BARKSDALE AFB, LA	4.37	NEW ORLEANS NAS, LA	3.31
AUSTIN/BERGSTROM AFB, TX	3.96	MT. WASHINGTON, NH	3.17
PORTSMOUTH/PEASE AFB, NH	3.88	HARTFORD, CT	3.16
PORT ARTHUR, TX	3.69	WHIDBEY ISLAND NAS, WA	3.16
SEATTLE-TACOMA, WA	3.68	LANSING, MI	3.06
DALLAS/LOVE FIELD, TX	3.65	CAPE HATTERAS, NC	3.03
EL DORADO, AR	3.60		

OBSERVED PRECIPITATION November 4 – 10, 1990



CLIMATE ANALYSIS CENTER / NOAA

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F) November 4 – 10, 1990



CLIMATE ANALYSIS CENTER / NOAA

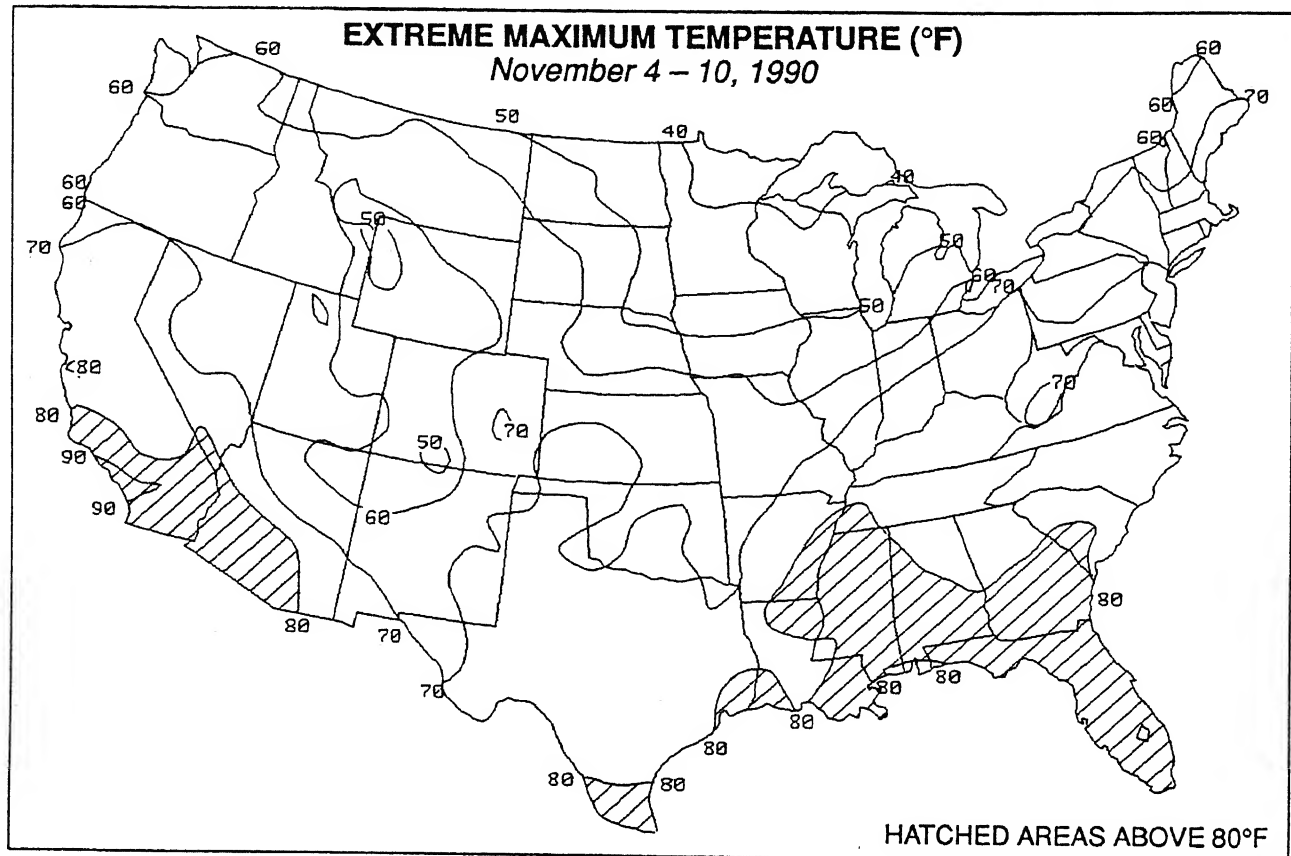


Figure 1. Extreme maximum temperatures (°F) during the week of November 4-10, 1990. Isotherms are drawn every 10°F, and shaded areas are more than 80°F. Indian Summer weather prevailed across the East and South early in the week as readings soared into the seventies as far north as coastal Maine before much colder air invaded the region. Farther west, extremely warm weather pushed temperatures into the nineties in southern California towards the week's end.

TABLE 2. Selected stations with temperatures averaging 3.5°F or more ABOVE normal for the week.

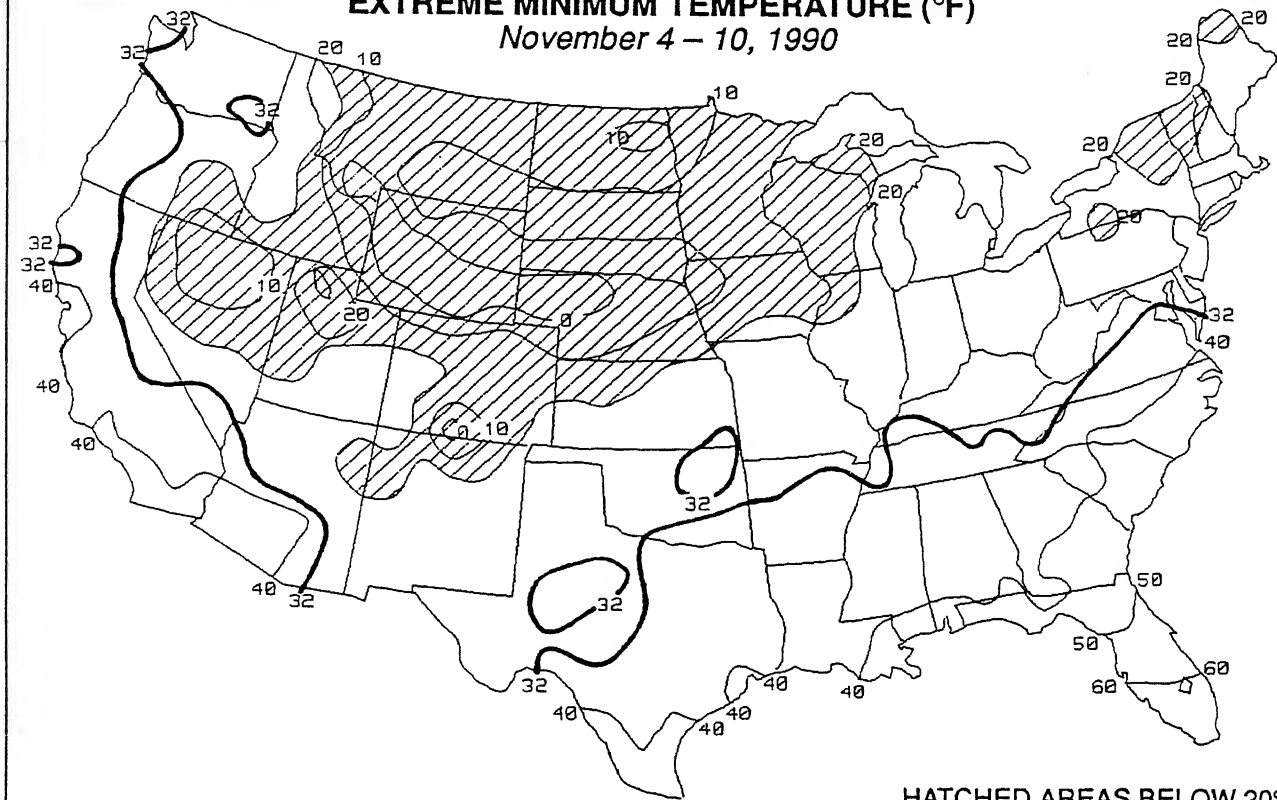
STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
OMAK, WA	+7.2	44.7	CAPE HATTERAS, NC	+4.3	63.0
LEWISTON, ID	+7.0	49.4	OLYMPIA, WA	+4.1	48.5
PORTLAND, OR	+4.9	52.5	FORT YUKON, AK	+4.0	5.9
BLUE CANYON, CA	+4.9	51.3	SAN FRANCISCO, CA	+3.9	60.2
SALEM, OR	+4.8	51.3	SEATTLE-TACOMA, WA	+3.9	50.4
PENDLETON, OR	+4.7	48.1	MELBOURNE, FL	+3.7	73.7
EUGENE, OR	+4.6	51.7	CHARLESTON, SC	+3.7	62.7
FORT MYERS, FL	+4.5	76.1	ISLIP, NY	+3.6	50.9
TAMPA, FL	+4.3	73.1	YAKIMA, WA	+3.6	44.4

Selected stations with temperatures averaging 9.0°F or more BELOW normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
ILLAMNA, AK	-14.4	7.0	SIoux CITY, IA	-10.4	30.3
BETTLES, AK	-14.3	-1.8	OMAHA/EPPELEY, NE	-10.2	33.5
ANCHORAGE, AK	-14.2	12.1	NORTH PLATTE, NE	-10.1	28.6
HOMER, AK	-13.7	13.4	NORTH OMAHA, NE	-10.1	33.4
NORTHWAY, AK	-12.7	-7.5	AMARILLO, TX	-9.7	38.9
CORDOVA/MILE 13, AK	-12.1	13.2	LARAMIE, WY	-9.3	23.0
NORFOLK, NE	-12.1	19.3	CEDAR RAPIDS, IA	-9.1	33.3
SIoux FALLS, SD	-11.9	-8.1	ENID/VANCE, OK	-9.1	43.5
	-11.7	21.4	SAN ANGELO, TX	-9.1	48.2
	-10.9	29.2	DES MOINES, IA	-9.0	33.8
			TRINIDAD, CO	-9.0	34.5
			FT. SILL/HENRY POST AAF, OK	-9.0	45.6

EXTREME MINIMUM TEMPERATURE (°F)

November 4 – 10, 1990

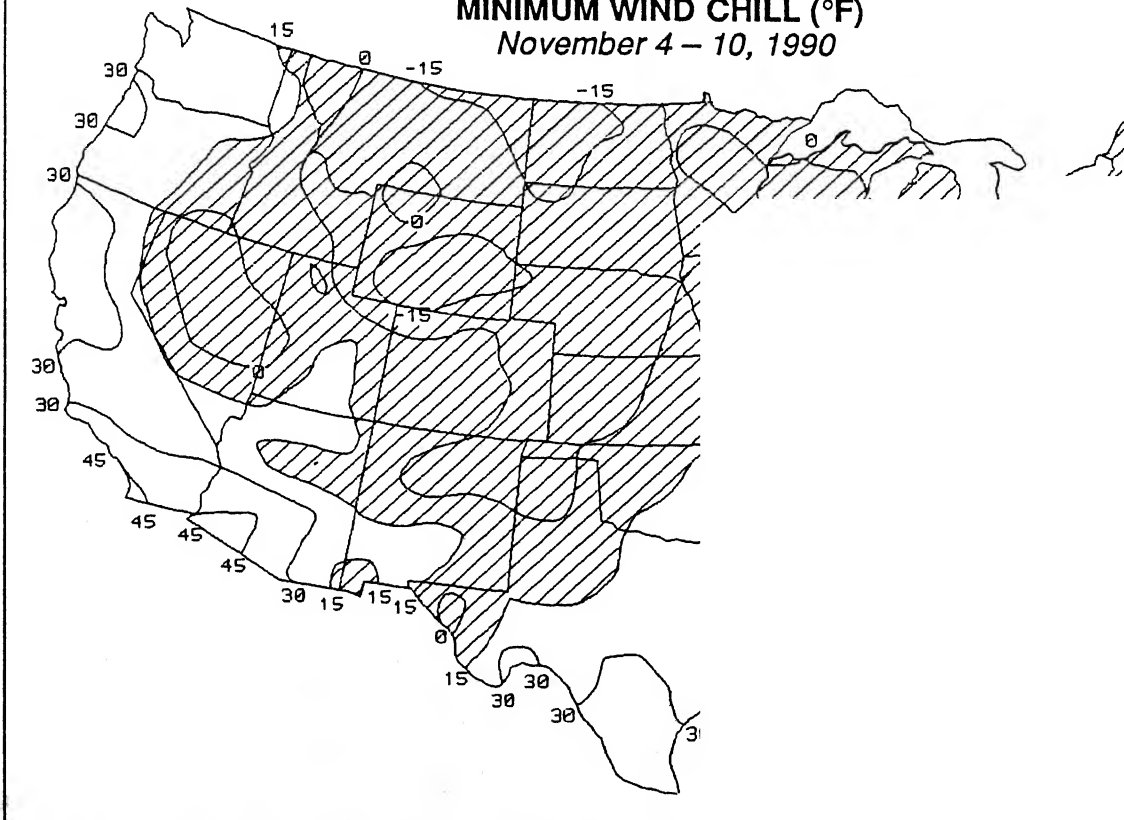


HATCHED AREAS BELOW 20°F

After recording extremely mild conditions last week, frigid Canadian air invaded much of the central U.S., sending temperatures into the teens across the north-central states and below 0°F in portions of the central Rockies and Plains (top). Two intense storm systems generated strong winds in the central and northeastern U.S., generating bitterly cold wind chills (<0°F) in the eastern Great Basin, northern and central Rockies and Plains, upper Midwest, and northern New England (bottom).

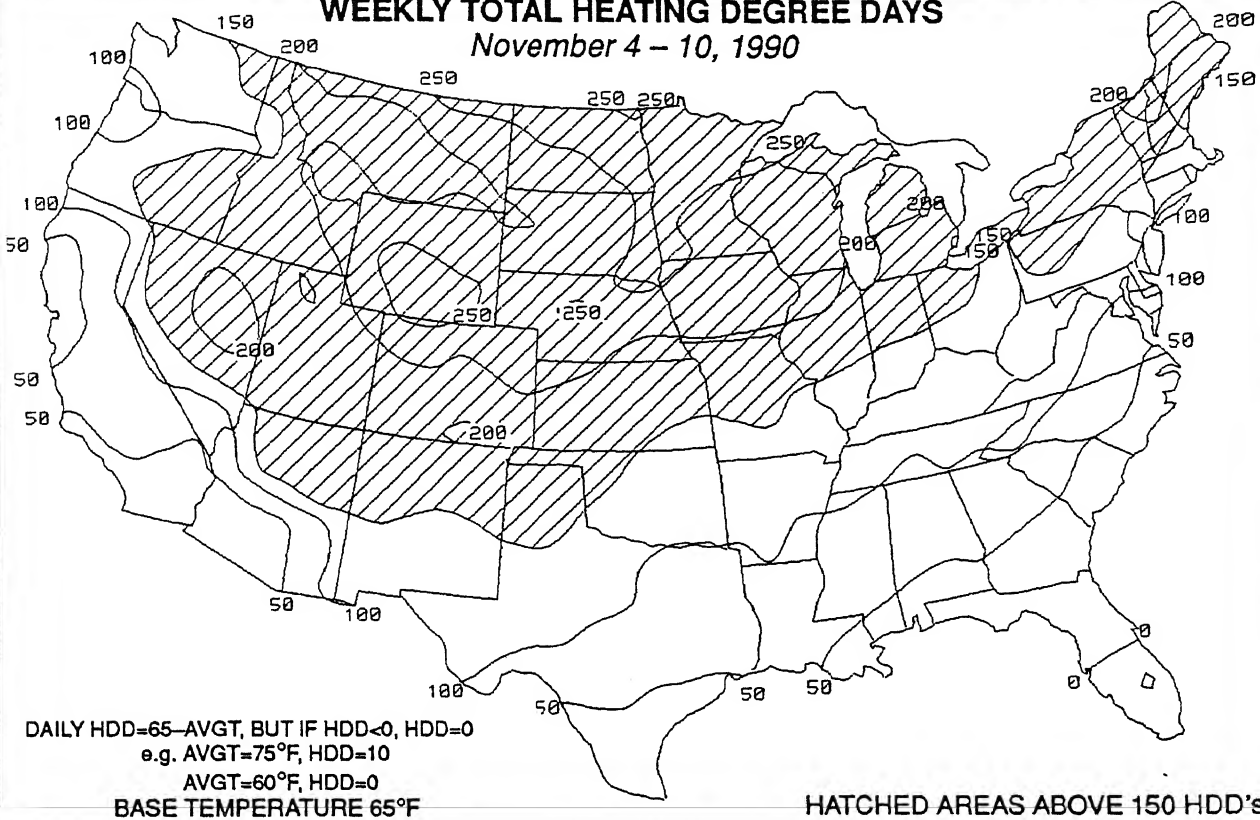
MINIMUM WIND CHILL (°F)

November 4 – 10, 1990



WEEKLY TOTAL HEATING DEGREE DAYS

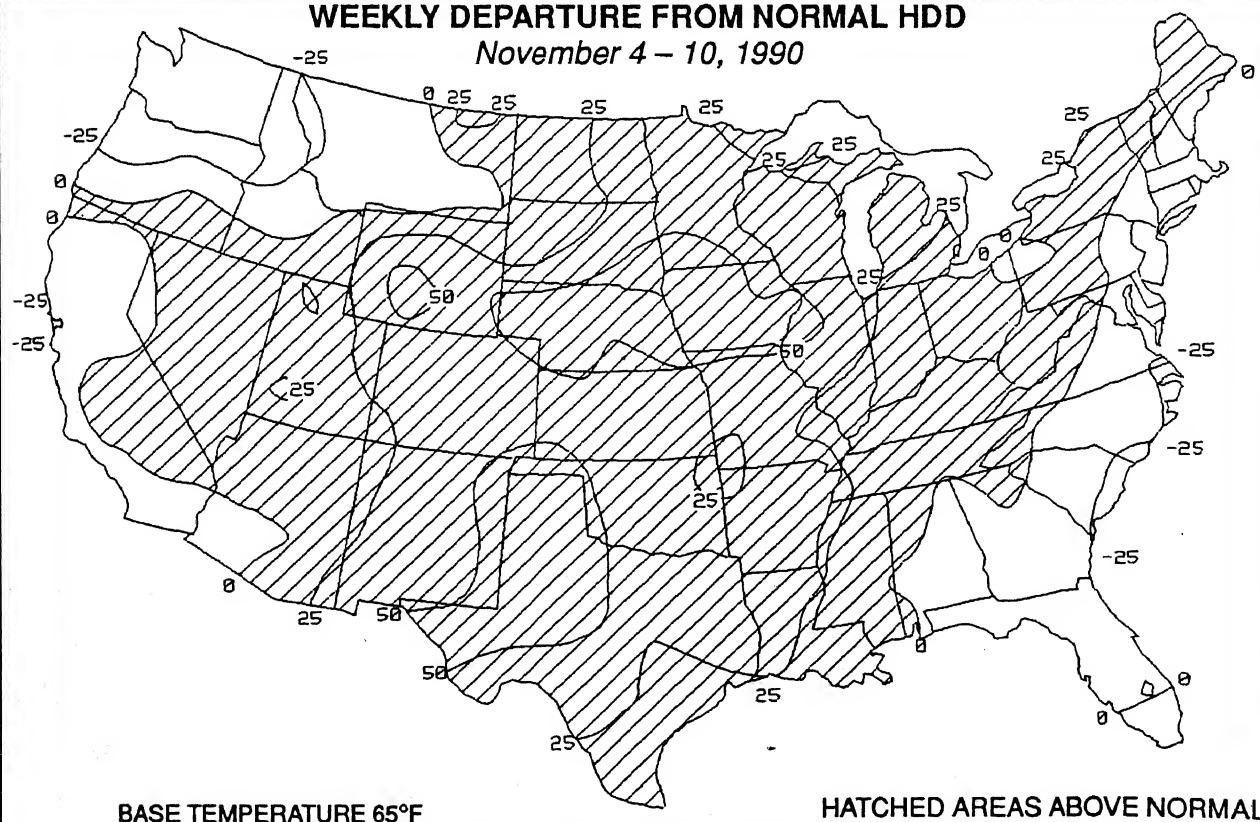
November 4 – 10, 1990



Unseasonably cold weather covered much of the nation's midsection, requiring significant (>150 HDD's) weekly heating usage (top). Above normal weekly heating demand was experienced throughout much of the lower 48 states, particularly in the western Corn Belt and southern High Plains (>50 HDD's), while slightly warmer than usual conditions along both coasts produced subnormal heating requirements (bottom).

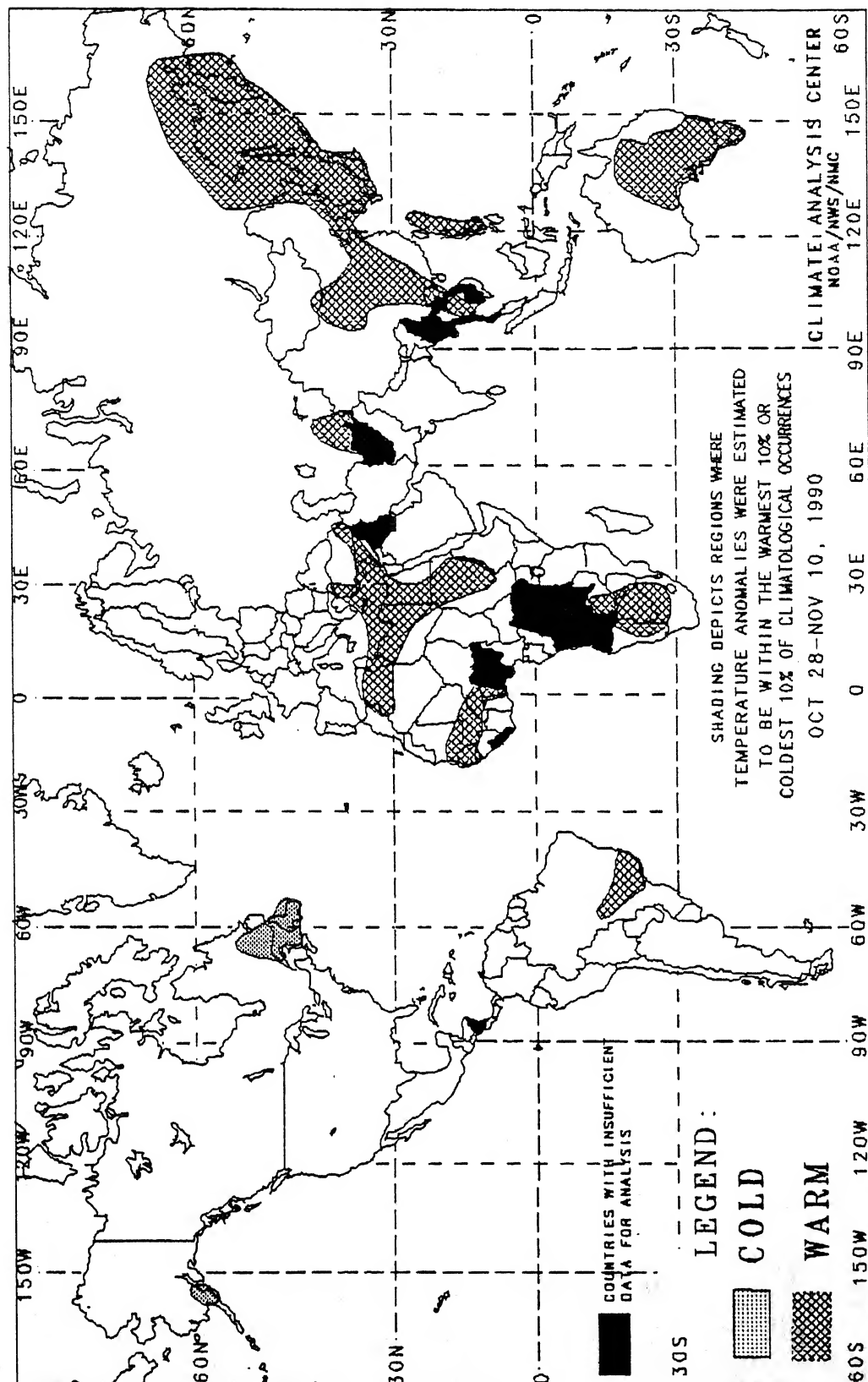
WEEKLY DEPARTURE FROM NORMAL HDD

November 4 – 10, 1990



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

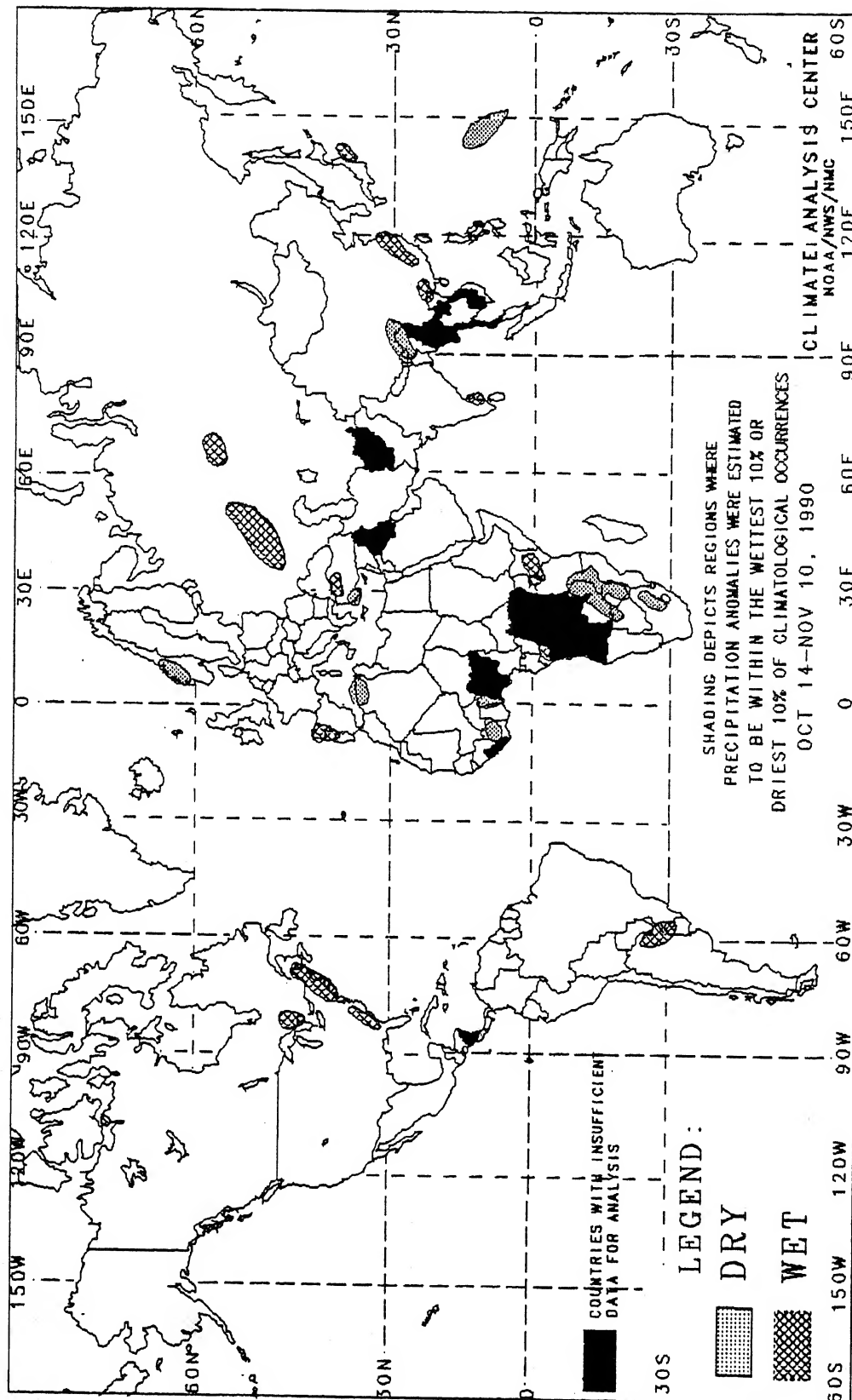
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

UNITED STATES MONTHLY CLIMATE HIGHLIGHTS

OCTOBER 1990

After a relatively quiet September, a suddenly active tropical Atlantic, along with a couple of stalled cold fronts, brought torrential rains to parts of the Southeast, abruptly ending abnormal dryness that began this Spring. Slow-moving storm systems also dumped ample precipitation throughout the remainder of the eastern third of the country. The Southeast, Northeast, and Central regions observed the 4th, 4th, and 8th wettest October on record, respectively. Extremely dry weather, however, along the western Gulf Coast states, in the central and northern Plains, and the Southwest compensated for the wetness in the East. As a result, October 1990 only ranked as the 38th wettest October nationally (since 1895). Although October 1990 temperatures averaged near the long-term mean [48th coldest] across the lower 48 states, there were many regional and temporal variations. The West, Southwest, Northeast, and Southeast recorded temperatures in the warmest third of the historic distribution while the Northwest, South, and Central were in the lower third of the long-term mean temperatures. The month was also interspersed by several warm and cold spells which produced over 70 daily low records and nearly twice as many daily record highs.

October 1990 commenced with temperatures more typical of August as highs soared into the eighties and nineties across much of the eastern half of the nation (Table 7). By the second week of the month, however, much colder air prevailed over the western two-thirds of the country. A storm system dropped over a foot of snow on portions of Colorado and Wyoming before whitening central Wisconsin with up to 6 inches. Farther east, moisture from the remnants of Tropical Storms Klaus and Marco streamed northward along a stalled cold front located over the Appalachians, dumping copious rains (more than 15 inches) on portions of the Southeast and mid-Atlantic. Augusta, GA received more rain from this Oct. 10–12 event (12.24") than during the previous 5 MONTHS (12.03"). A third storm, Hurricane Lili, threatened the East Coast, but it eventually turned northeastward and remained offshore. Several days later, the formation of Hurricane Nana made 1990 the fifth most active year on record in the tropical Atlantic (14 storms).

Around mid-month, a strong cold front triggered severe weather in the mid-Atlantic, including five of the month's 24 tornadoes (Figure 1) within a 75-mile radius of Washington, D.C. Farther west, a storm system battered the Pacific Northwest with heavy rains and high winds. During the last full week of October, two intense low pressure centers developed along a slow-moving cold front and moved northeastward up the Atlantic Coast. Many locations in the East measured over 2 inches of rain, with amounts exceeding 6 inches across sections of the Carolinas. The heavy rains fell on top of already-saturated ground, producing widespread flooding from Georgia to Maine. Strong winds also accompanied the rains. Winds reached hurricane strength along parts of the Atlantic Coast, with South Island near Norfolk, VA recording gusts up to 92 mph. In the Outer Banks of North Carolina, the high winds ripped a dredge from its

moorings and pushed it into the Herbert Bonner Bridge, knocking out a 250-foot section and stranding thousands of residents and tourists. During the last few days of October, however, high pressure over the East brought tranquil conditions to the area while the central U.S. experienced mild Indian Summer weather. Meanwhile, the Pacific Northwest was hit by another strong storm system.

According to the River Forecast Centers, the greatest monthly totals (more than 10 inches) were found from eastern Georgia northward through most of South Carolina, west-central North Carolina, and western Virginia, at isolated locations in southern Arkansas, eastern Massachusetts, eastern Hawaii, and southeastern Alaska, along parts of the Pacific Northwest Coast, and in the northern Cascades (Table 1). Nearly a dozen stations in the East set October precipitation records (Table 5). Surplus October precipitation also fell throughout much of the nation east of the Mississippi River, on central Texas, western Utah, from Colorado northeastward into central Minnesota, and across most of the Pacific Northwest (Figures 2 and 3, Table 1). The generous October precipitation in the Northeast continued the region's wet weather pattern this year. During Jan.–Oct. 1990, the Northeast observed the second wettest such period since 1895 (Figure 10).

In contrast, ample precipitation in the East was offset by abnormal October dryness in most of the western half of the U.S. and across much of Alaska. Less than half the normal monthly precipitation occurred in the upper Missouri Valley and northern Plains, the southern Rockies and south-central Plains, along the western Gulf Coast, in the Southwest, and across the western Hawaiian Islands (Table 2, Figures 2 and 3). Approximately 25% of the country, particularly the West, remained in the severe to extreme long-term drought category based upon the Palmer Drought Index (Figure 8).

Although unseasonably warm weather dominated much of the nation early (Table 7) and late in the month, a series of cold air outbreaks during the remainder of October, especially in the country's midsection, limited above normal monthly temperatures to along the Atlantic Seaboard and throughout the southwestern U.S. (Table 3, Figures 4 and 5). Most of Hawaii and northern Alaska also experienced slightly warmer than usual October conditions. Even with near normal October national temperatures, the first ten months of 1990 continued to be the third warmest such period in the contiguous U.S. during the past 96 years (Figure 7). Regionally, another month of above normal temperatures (21st warmest October) in the Southeast produced the warmest January–October period on record (Figure 9).

Thanks to several cold air intrusions during the middle of the month, subnormal October temperatures prevailed throughout much of the central third of the country with departures generally between -1°F and -2°F (Table 4, Figures 4 and 5). Slightly colder than usual weather also occurred in the Pacific Northwest and across southern Alaska. The lowest ranked region was the Northwest (28th coldest October).

TEMPERATURE AND PRECIPITATION RANKINGS FOR OCTOBER 1990, BASED ON THE PERIOD 1895 – 1990 (96 YEARS) WHERE 1 = DRIEST/COLDEST AND 96 = WETTEST/HOTTEST.

<u>REGION</u>	<u>PRECIPITATION</u>	<u>TEMPERATURE</u>
NORTHEAST	93	81
EAST NORTH CENTRAL	63	33
CENTRAL	89	32
SOUTHEAST	93	76
WEST NORTH CENTRAL	26	40
SOUTH	40	31
SOUTHWEST	40	65
NORTHWEST	75	28
WEST	19	82
NATIONAL	59	48

National Climatic Data Center

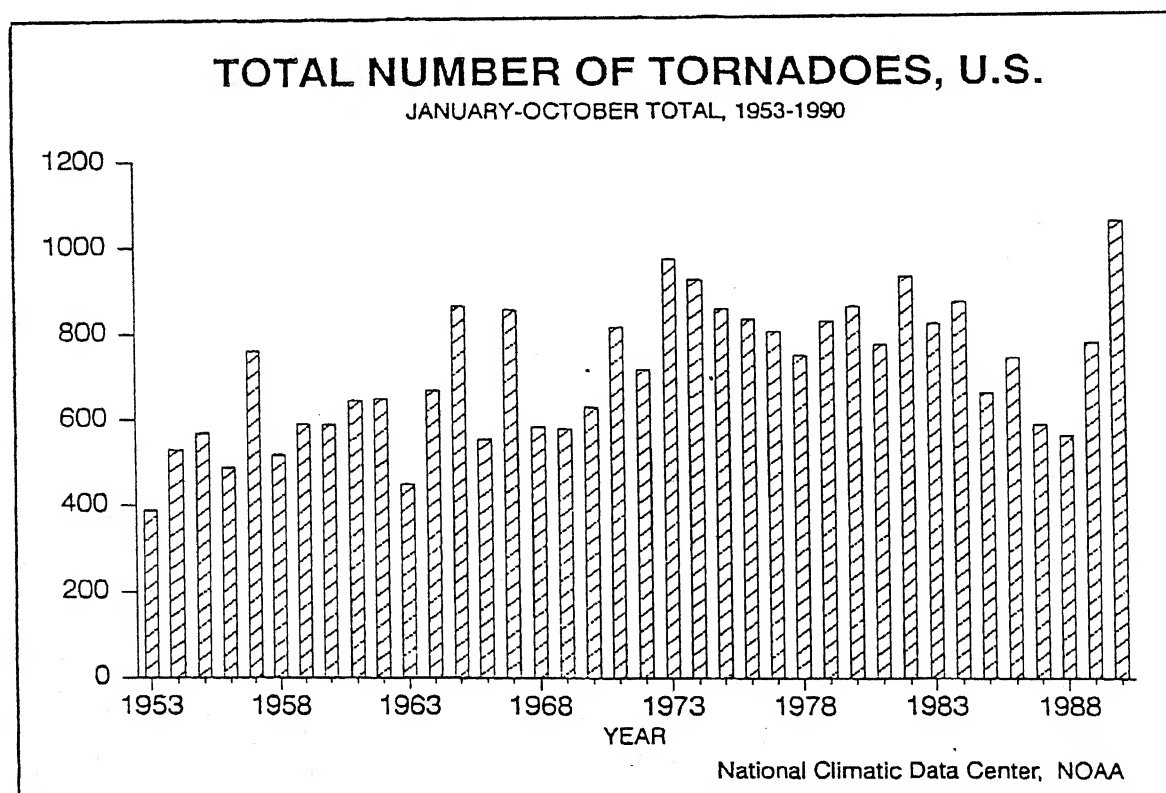
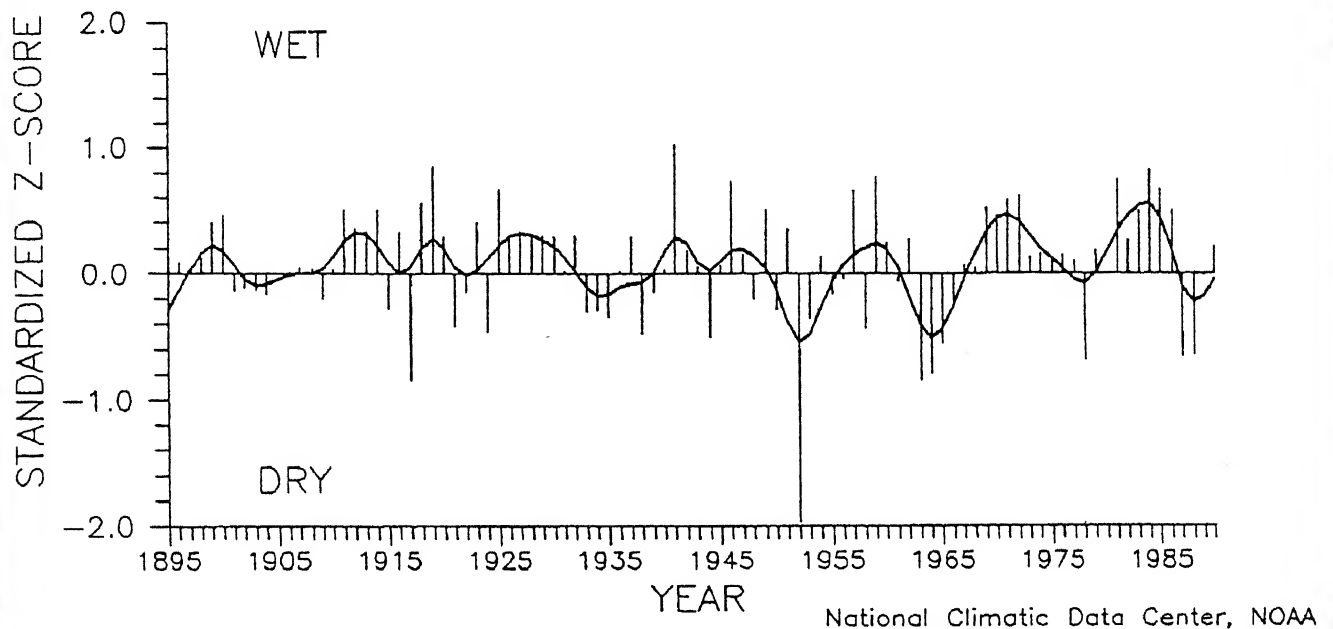


Figure 1. Total number of tornadoes in the contiguous U.S., January-October, 1953-1990. According to preliminary data from the NWS, there were 24 tornadoes during October 1990, near the 1953-1989 average of 23. The January-October adjusted preliminary total of 1059 is a record and compares to the 37-year final data mean of 703.

U.S. NATIONAL MEAN PRECIPITATION INDEX OCTOBER, 1895-1990



U.S. National October 1990 mean precipitation index (top) and temperature (bottom). The monthly precipitation for each climate division in the country (total of 344) was first standardized over the 1951-1980 period, then weighed by area and averaged to determine a national standardized precipitation value. Negative (positive) values are dry (wet). Based upon the index, the **October 1990 precipitation was SLIGHTLY ABOVE the long-term mean** (the 38th wettest October during the past 96 years). Regionally, the Northeast, Southeast, and Central regions observed the 4th, 4th, and 8th wettest October ever, respectively, while the driest regions were the West (19th) and West-North Central (26th). Across the contiguous U.S., **October 1990 temperatures averaged NEAR the long-term mean**, ranking as the 48th coldest (49th warmest) October on record (since 1895). Regionally, the West, Northeast, Southeast, and Southwest were in the warm third of the historic distribution while the Northwest, South, and Central were in the cool third of the long-term occurrences.

U.S. NATIONAL TEMPERATURE OCTOBER, 1895-1990

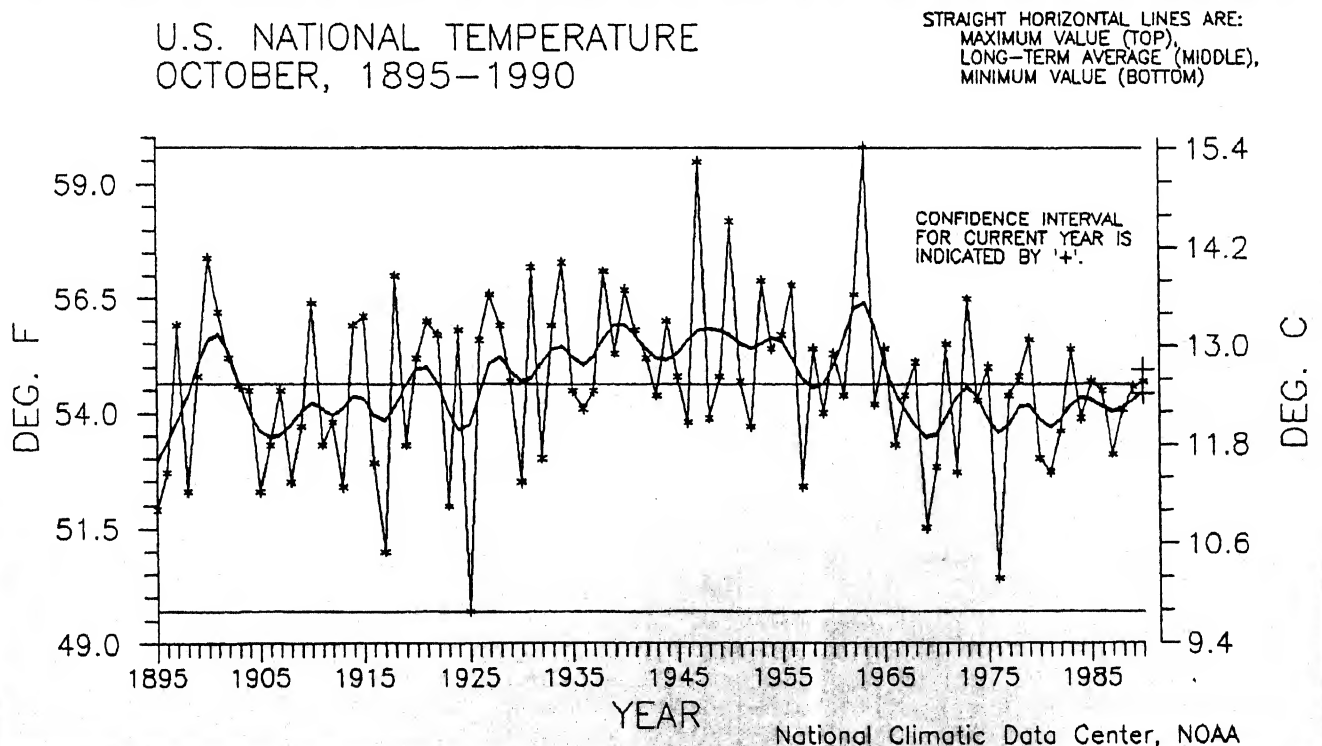


TABLE 1. SELECTED STATIONS WITH 150% OR MORE OF THE NORMAL PRECIPITATION AND 7.5 INCHES OR MORE PRECIPITATION; OR, STATIONS WITH 7.5 INCHES OR MORE PRECIPITATION AND NO NORMALS DURING OCTOBER 1990.

<u>STATION</u>	<u>TOTAL</u> <u>(INCHES)</u>	<u>PCT. OF</u> <u>NORMAL</u>	<u>STATION</u>	<u>TOTAL</u> <u>(INCHES)</u>	<u>PCT. OF</u> <u>NORMAL</u>
HILO/LYMAN, HAWAII, HI	20.94	209.6	BEAUFORT MCAS, SC	9.42	***
SUMTER/SHAW AFB, SC	17.32	651.1	ISLIP, NY	9.40	255.4
QUILLAYUTE, WA	15.85	152.1	PINE BLUFF, AR	9.19	289.9
AUGUSTA, GA	14.82	737.3	LIMESTONE/LORING AFB, ME	8.93	***
CHARLOTTE, NC	14.72	545.2	CARIBOU, ME	8.73	282.5
MT. WASHINGTON, NH	13.56	202.1	WAYCROSS, GA	8.63	342.5
ASHEVILLE, NC	12.59	402.2	PENSACOLA, FL	8.51	230.6
GREENSBORO, NC	12.59	398.4	CHARLOTTESVILLE, VA	8.37	***
SAVANNAH, GA	12.50	548.2	WORCESTER, MA	8.20	194.8
COLUMBIA, SC	11.66	453.7	ANDERSON, SC	7.74	282.5
HICKORY, NC	11.48	336.7	MARTINSBURG, WV	7.69	258.9
LYNCHBURG, VA	10.81	320.8	HARTFORD, CT	7.63	218.6
FLORENCE, SC	10.80	453.8	CAPE CANAVERAL AFS, FL	7.61	***
PORTSMOUTH/PEASE AFB, NH	10.50	***	EUGENE, OR	7.59	220.0
ROANOKE, VA	9.89	286.7	LITTLE ROCK, AR	7.58	268.8
VALPARAISO/EGLIN AFB, FL	9.60	327.6	NORTH BEND, OR	7.54	170.2
WILLIAMSPORT/LYCOMI, PA	9.55	298.4	BRUNSWICK NAS, ME	7.53	204.1
GREENVILLE, SC	9.45	276.3			

(Note: Stations without precipitation normals are indicated by asterisks.)

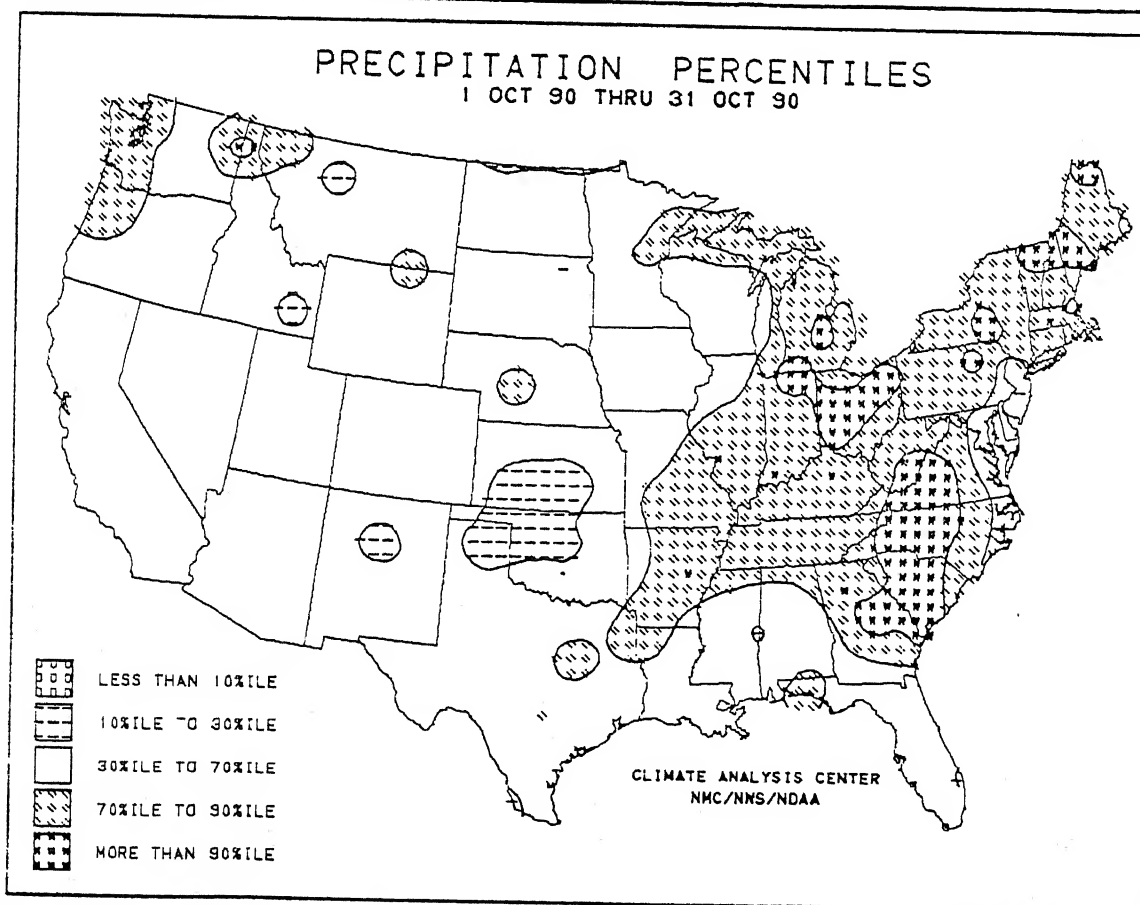


Figure 2. October 1990 precipitation percentiles. Significant (>70%ile) October precipitation fell on the northwestern corner of the country and on much of the eastern third of the nation, particularly in eastern Georgia, the Carolinas, and southern Virginia, where abnormal dryness during the past 6 months was abruptly ended by torrential rains (up to 20.5 inches in central South Carolina). In contrast, substantial (<30%ile) October dryness occurred in parts of the central and northern Plains and northern Rockies.

TABLE 2. SELECTED STATIONS WITH 67% OR LESS NORMAL PRECIPITATION AND NORMAL PRECIPITATION 3.00 INCHES OR MORE DURING OCTOBER 1990.

<u>STATION</u>	<u>TOTAL</u> <u>(INCHES)</u>	<u>PCT. OF</u> <u>NORMAL</u>	<u>NORMAL</u> <u>(INCHES)</u>	<u>STATION</u>	<u>TOTAL</u> <u>(INCHES)</u>	<u>PCT. OF</u> <u>NORMAL</u>	<u>NORMAL</u> <u>(INCHES)</u>
LIHUE, KAUAI, HI	0.48	10.7	4.50	APALACHICOLA, FL	1.96	61.5	3.19
HAMPTON/LANGLEY AFB, VA	1.03	30.4	3.39	LAFAYETTE, LA	2.13	66.7	3.20
FT SILL/HENRY POST, OK	1.16	36.6	3.17	TULSA, OK	2.15	63.5	3.39
BURLINGTON, IA	1.22	40.0	3.05	CHANUTE, KS	2.21	64.0	3.45
KOKEE, KAUAI, HI	1.38	29.6	4.67	FT. MEYERS, FL	2.27	58.8	3.86
LAKE CHARLES, LA	1.48	40.2	3.68	BROWNSVILLE, TX	2.29	65.2	3.52
VICTORIA, TX	1.56	47.1	3.31	ADAK, AK	2.45	36.6	6.70
HOMER, AK	1.64	50.0	3.28	VALDEZ, AK	2.53	37.3	6.78
PALACIOS, TX	1.72	43.1	3.99	WEST PALM BEACH, FL	3.45	44.5	7.76
BILOXI/KEESLER AFB, MS	1.76	55.4	3.18	CORDOVA/MILE 13, AK	7.30	56.4	12.94

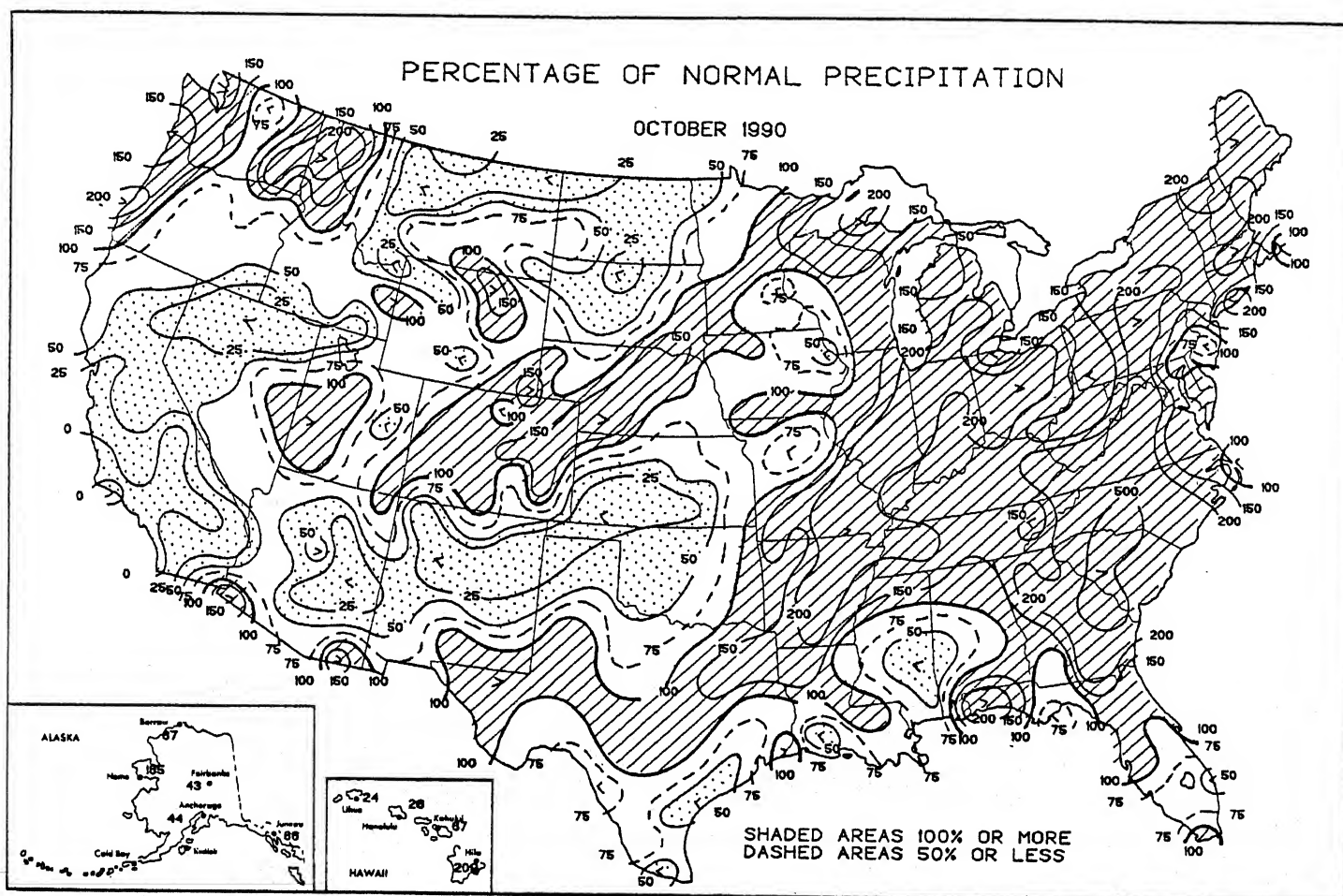


Figure 3. October 1990 percent of normal precipitation. Surplus monthly precipitation, especially across the central Carolinas [$>500\%$], was prevalent throughout the U.S. east of the Mississippi River, in portions of the southern and north-central Plains, central Rockies, and Pacific Northwest. Subnormal October precipitation, however, was common in the northern and south-central Plains, Southwest, California and the Great Basin, central Gulf Coast, western Hawaiian Islands, and across southern Alaska.

TABLE 3. OCTOBER 1990 AVERAGE TEMPERATURES 4.0°F OR MORE ABOVE NORMAL.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
VICTORVILLE/GEORGE AFB, CA	+6.3	67.3	NEW YORK/KENNEDY, NY	+4.5	61.1
ISLIP, NY	+6.2	60.7	RENO, NV	+4.5	54.7
PROVIDENCE, RI	+5.4	58.6	GOLDSBORO/JOHNSON AFB, NC	+4.4	66.8
PHOENIX, AZ	+5.2	78.6	MILLVILLE, NJ	+4.4	60.5
NEW YORK/LA GUARDIA, NY	+5.2	63.0	CAPE HATTERAS, NC	+4.3	69.4
PHILADELPHIA, PA	+5.2	61.9	NORFOLK, VA	+4.3	65.8
PUNTA PIEDRAS BLANCAS, CA	+5.2	61.5	RALEIGH-DURHAM, NC	+4.3	64.0
SAN BERNARDINO/NORTON AFB, CA	+5.1	70.4	FLORENCE, SC	+4.2	68.1
NEWARK, NJ	+5.0	62.2	WILMINGTON, NC	+4.1	68.7
ASHEVILLE, NC	+5.0	61.2	NEW BERN, NC	+4.1	67.7
HARTFORD, CT	+4.9	57.4	ALLENTOWN, PA	+4.1	57.6
CHARLESTON, SC	+4.7	70.5	PORTLAND, ME	+4.0	52.3
RICHMOND/BYRD, VA	+4.5	63.1	MT. WASHINGTON, NH	+4.0	34.7

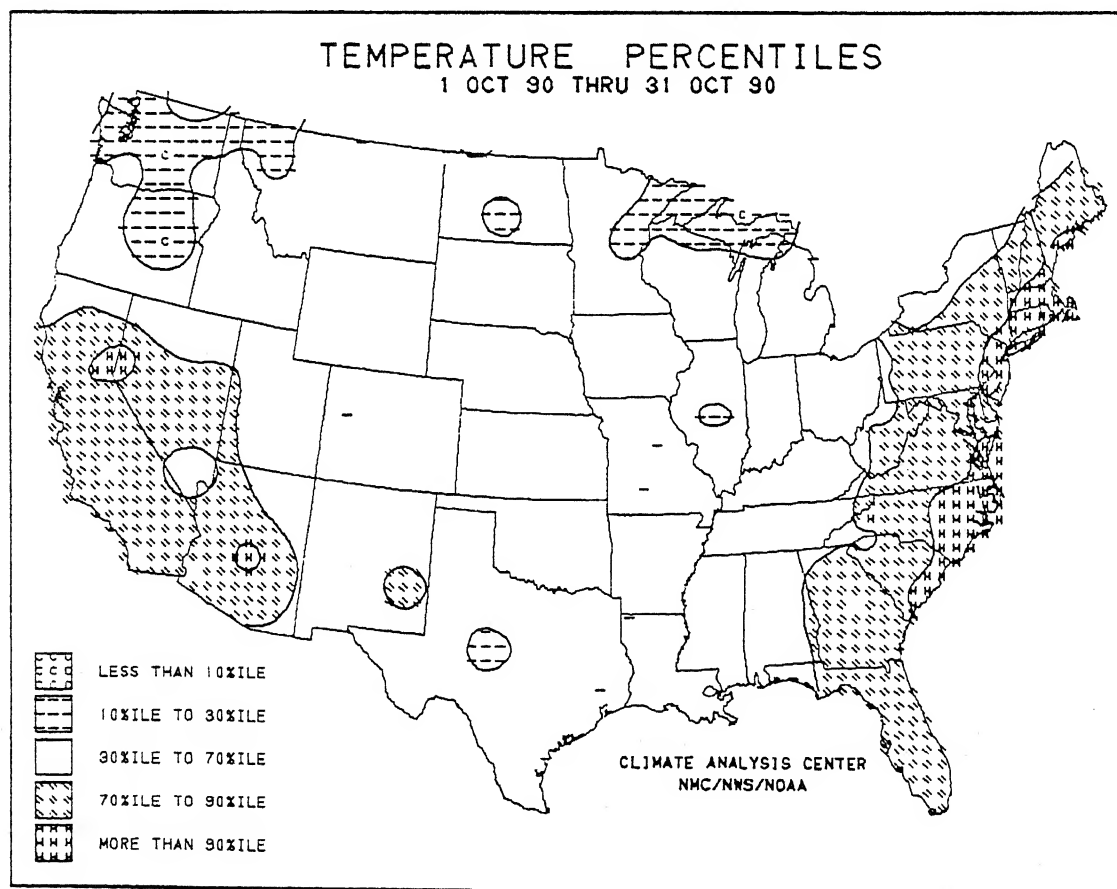


Figure 4. October 1990 temperature percentiles. Substantial (>70%ile) October warmth was generally confined to the extreme western and eastern parts of the U.S., namely in the Southwest and along the Atlantic Seaboard. Significant (<30%ile) subnormal monthly temperatures were limited to the Northwest and upper Great Lakes region, although much of the nation's midsection experienced slightly cooler (but not significant) than usual conditions.

TABLE 4. OCTOBER 1990 AVERAGE TEMPERATURES 2.5°F OR MORE BELOW NORMAL.

LOCATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
DELTA, AK	-4.9	20.4	JONESBORO, AR	-3.1	59.6
WASCO, OR	-4.1	43.7	HARRISON, AR	-3.0	56.7
PARBLUFF, MO	-4.1	56.3	MARQUETTE, MI	-2.9	41.4
HEETNA, AK	-3.9	27.9	NORTHWAY, AK	-2.7	18.7
HEWLETT AFB, AR	-3.7	59.4	ST. CLOUD, MN	-2.7	44.1
IRON SUMMIT, OR	-3.4	47.5	JOPLIN, MO	-2.7	57.4
ATCHEE, WA	-3.4	47.9	ENID/VANCE AFB, OK	-2.7	59.5
TELL PLAINS, MO	-3.3	54.4	SAN ANGELO, TX	-2.7	63.7
MA, WA	-3.1	46.8	PARK FALLS, WI	-2.6	43.2

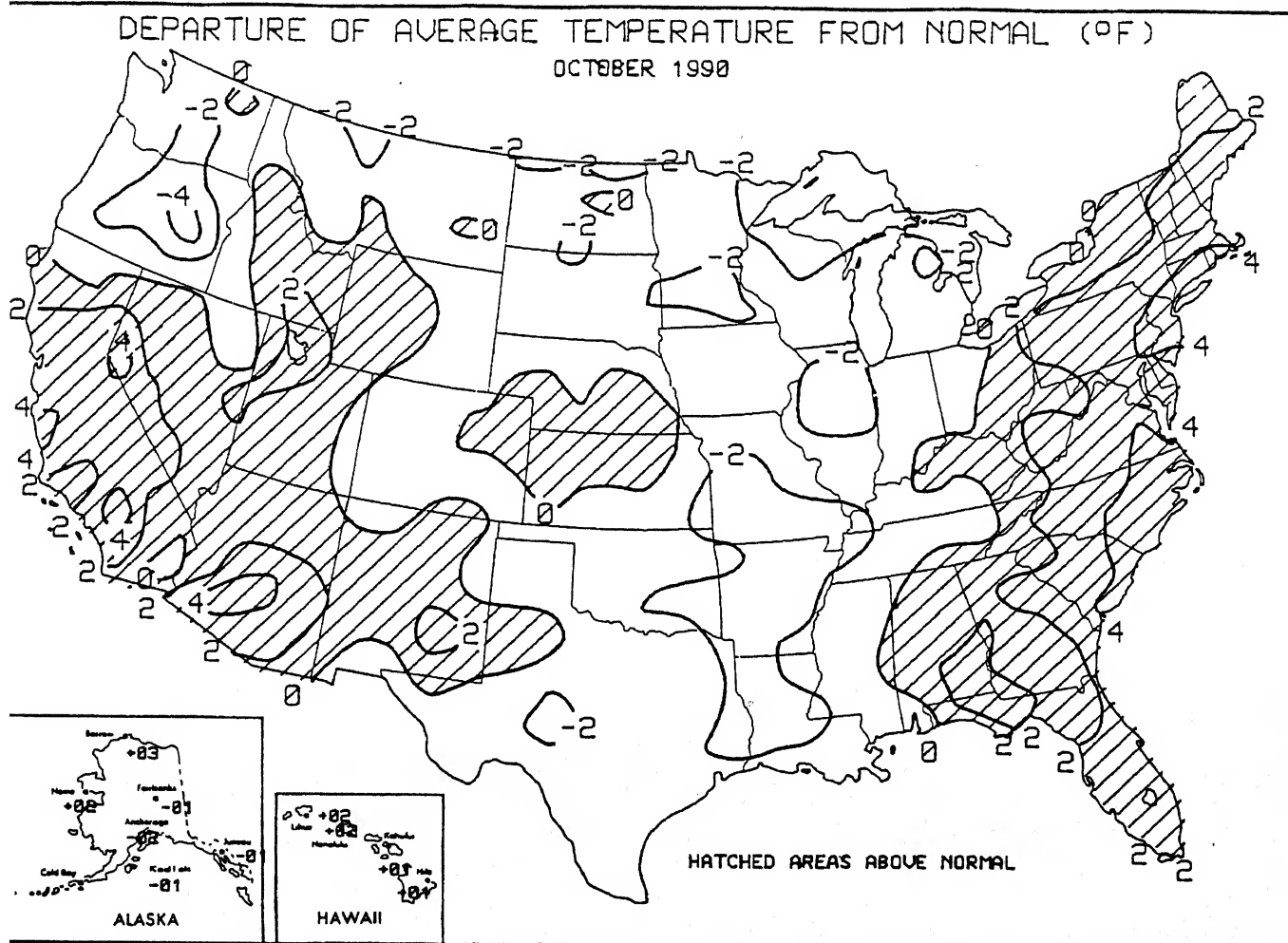


Figure 5. October 1990 temperature departure from normal (°F). Although national October temperatures averaged near the long-term mean, there were several regional variations. Monthly temperatures averaged more than 2°F above normal along the East Coast and in most of California and the desert Southwest while October departures less than -2°F were found in the northern Intermountain West, northern Plains and upper Midwest, and the lower and middle Mississippi Valley. Hawaiian temperatures were slightly above normal, and Alaska recorded somewhat milder than normal weather in the northwest and slightly colder than usual conditions in the south.

TABLE 5. RECORD OCTOBER PRECIPITATION.

<u>STATION</u>	<u>TOTAL</u> (INCHES)	<u>NORMAL</u> (INCHES)	<u>PCT. OF</u> <u>NORMAL</u>	<u>RECORD</u> <u>TYPE</u>	<u>RECORDS</u> <u>BEGAN</u>
AUGUSTA, GA	14.82	2.01	737.3	HIGHEST	1947
CHARLOTTE, NC	14.72	2.70	545.2	HIGHEST	1947
MT. WASHINGTON, NH	13.56	6.71	202.1	HIGHEST	1944
ASHEVILLE, NC	12.59	3.13	402.2	HIGHEST	1903
GREENSBORO, NC	12.59	3.16	398.4	HIGHEST	1951
SAVANNAH, GA	12.50	2.28	548.2	HIGHEST	1951
ROANOKE, VA	9.89	3.45	286.7	HIGHEST	1947
WILLIAMSPORT/LYCOMI, PA	9.55	3.20	298.4	HIGHEST	1947
CARIBOU, ME	8.73	3.09	282.5	HIGHEST	1947
BECKLEY, WV	5.91	2.68	220.5	HIGHEST	1953
LANSING, MI	5.58	1.88	296.8	HIGHEST	1959
LIHUE, KAUAI, HI	0.48	4.50	10.7	LOWEST	1905
OMAK, WA	0.00	0.82	0.0	LOWEST	1946
SANTA MARIA, CA	0.00	0.44	0.0	LOWEST	1947
PASO ROBLES, CA	0.00	0.40	0.0	LOWEST	1951
SANTA BARBARA, CA	0.00	0.35	0.0	LOWEST	1951
SAN DIEGO/LINDBERGH, CA	0.00	0.31	0.0	LOWEST	1851
VICTORVILLE/GEORGE AFB, CA	0.00	0.29	0.0	LOWEST	1939
LOS ANGELES, CA	0.00	0.25	0.0	LOWEST	1947

Note: Trace precipitation is considered no precipitation. Stations with no precipitation are only included if normal precipitation is 0.25 inches or more.

TABLE 6. RECORD OCTOBER AVERAGE TEMPERATURES.

<u>STATION</u>	<u>AVERAGE</u> (°F)	<u>NORMAL</u> (°F)	<u>DEPARTURE</u> (°F)	<u>RECORD</u> <u>TYPE</u>	<u>RECORDS</u> <u>BEGAN</u>
NEW YORK/LA GUARDIA, NY	63.0	57.7	+5.2	HIGHEST	1947
BRIDGEPORT, CT	59.5	55.8	+3.8	HIGHEST	1951
MIAMI, FL	80.4	77.9	+2.5	HIGHEST	1947

TABLE 7. RECORD OCTOBER EXTREME TEMPERATURES.

<u>STATION</u>	<u>EXTREME</u> (°F)	<u>DATE</u>	<u>RECORD</u> <u>TYPE</u>	<u>RECORDS</u> <u>BEGAN</u>
BAKERSFIELD, CA	103	04 OCT 90	HIGHEST	1938
VALENTINE, NE	96	05 OCT 90	HIGHEST	1956
VICTORIA, TX	96	04 OCT 90	HIGHEST	1961
NORFOLK, NE	95	05 OCT 90	HIGHEST	1946
TAMPA, FL	94	03 OCT 90	HIGHEST	1941
NORTH PLATTE, NE	94	05 OCT 90	HIGHEST	1948
HOUSTON, TX	94	01 OCT 90	HIGHEST	1970
LAKE CHARLES, LA	92	01 OCT 90	HIGHEST	1962
NEW ORLEANS/MOISANT, LA	92	09 OCT 90	HIGHEST	1939
NEW YORK/LA GUARDIA, NY	87	06 OCT 90	HIGHEST	1941

PRECIPITATION RANKINGS FOR JAN – OCT 1990, BASED ON THE PERIOD 1895 – 1990 (96 YEARS) WHERE 1 = DRIEST AND 96 = WETTEST.

<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>
AL	70	IA	90	NE	36	RI	78
AZ	76	KS	60	NV	48	SC	42
AR	90	KY	75	NH	94	SD	57
CA	25	LA	60	NJ	81	TN	63
CO	70	ME	80	NM	70	TX	78
CT	90	MD	65	NY	94	UT	41
DE	74	MA	89	NC	50	VT	94
FL	9	MI	89	ND	25	VA	69
GA	32	MN	58	OH	96	WA	90
ID	52	MS	68	OK	89	WV	73
IL	92	MO	87	OR	54	WI	89
IN	95	MT	16	PA	89	WY	32

National Climatic Data Center

Top 10 rankings : **BOLD**

Bottom 10 rankings : *Italics*

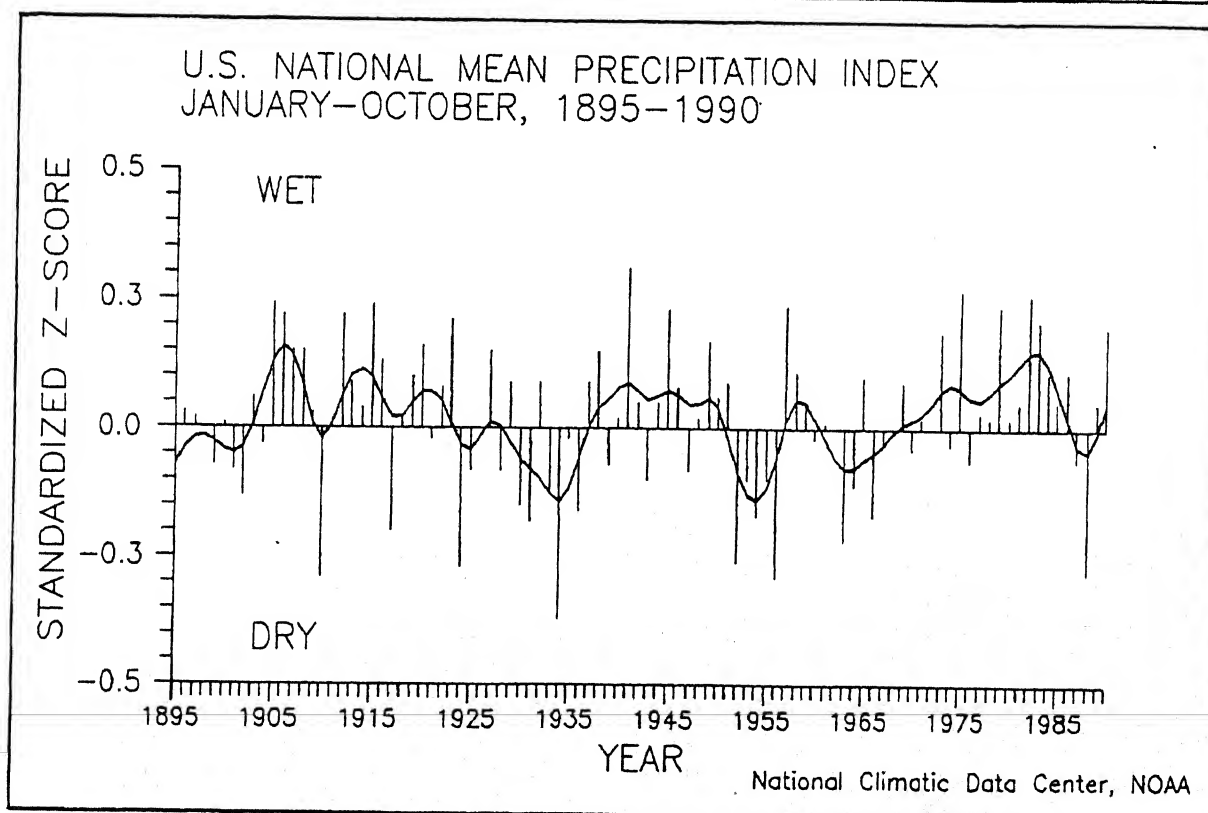


Figure 6. U.S. national mean precipitation index January–October, 1895–1990. With 16 states recording one of the top ten wettest Jan.–Oct. periods ever (see table above), and only one state (FL) observing one of the ten driest 10-month periods on record, it is not surprising that the first ten months of 1990 are ranked as the 13th wettest (during the past 96 years) across the lower 48 states. In addition, the heavy October rains in the southern Atlantic Coast states jumped the state precipitation rankings in South Carolina from tenth driest [Jan.–Sep.] up to 42nd driest [Jan.–Oct.], as well as Georgia from 13th to 32nd, and North Carolina from 17th to 50th.

TEMPERATURE RANKINGS FOR JAN - OCT 1990, BASED ON THE PERIOD 1895 - 1990 (96 YEARS) WHERE 1 = COLDEST AND 96 = WARMEST.

<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>
AL	79	IA	91	NE	85	RI	95
AZ	81	KS	83	NV	89	SC	94
AR	82	KY	84	NH	94	SD	91
CA	87	LA	84	NJ	95	TN	79
CO	85	ME	75	NM	72	TX	74
CT	94	MD	94	NY	91	UT	92
DE	96	MA	86	NC	96	VT	92
FL	96	MI	76	ND	94	VA	94
GA	91	MN	93	OH	84	WA	90
ID	94	MS	79	OK	83	WV	87
IL	78	MO	82	OR	89	WI	92
IN	78	MT	90	PA	91	WY	92

National Climatic Data Center

Top 10 rankings : **BOLD**

Bottom 10 rankings : *Italics*

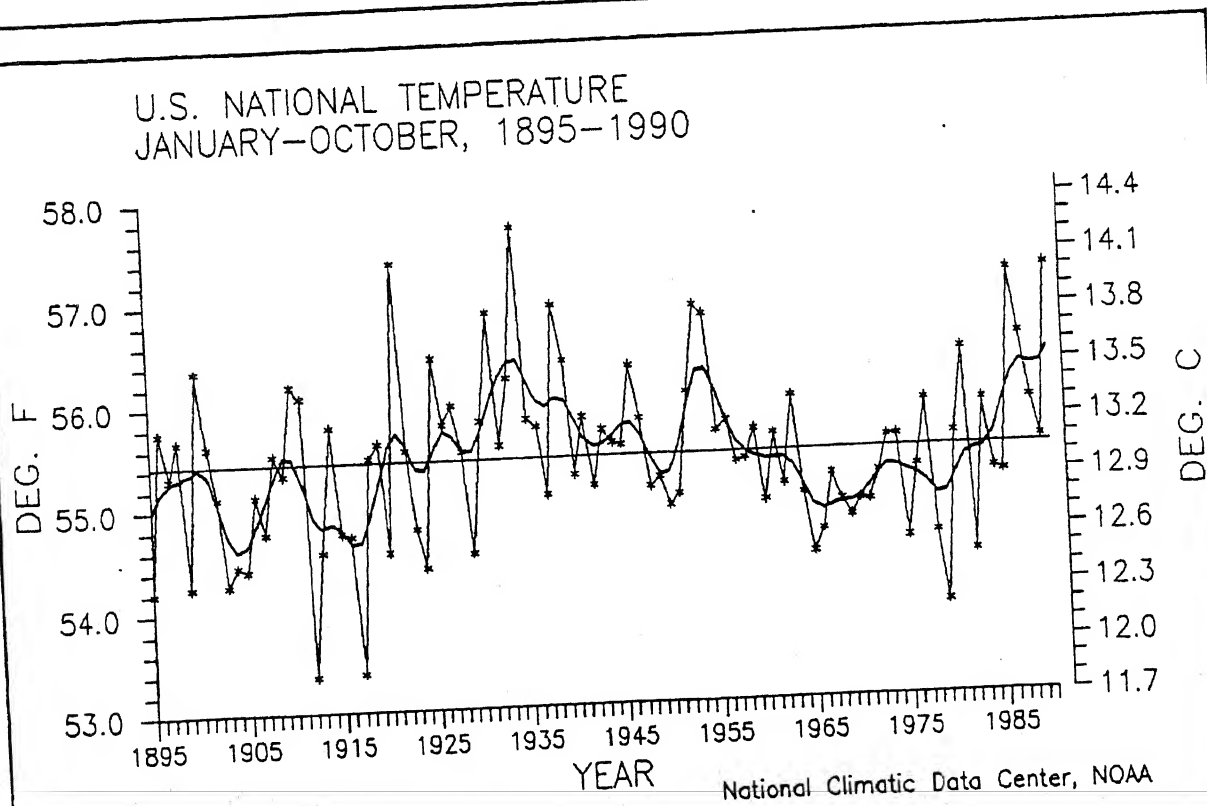
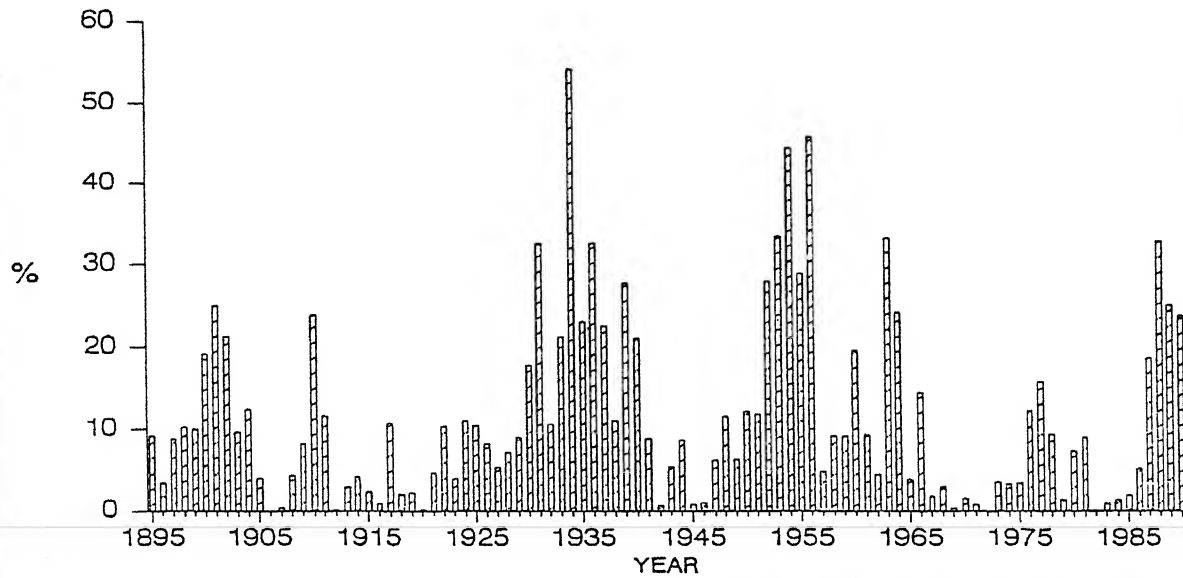


Figure 7. U.S. national temperatures January-October, 1895-1990. Although national temperatures during October 1990 were "abnormally" normal as compared to most of the other months of 1990, the first ten months of 1990 remained as the third warmest such period on record, exceeded only by 1934 (warmest) and 1921 (2nd warmest). Twenty-eight states have observed one of the top ten warmest Jan.-Oct. periods during the past 96 years (see above table).

U.S. NATIONAL - OCTOBER

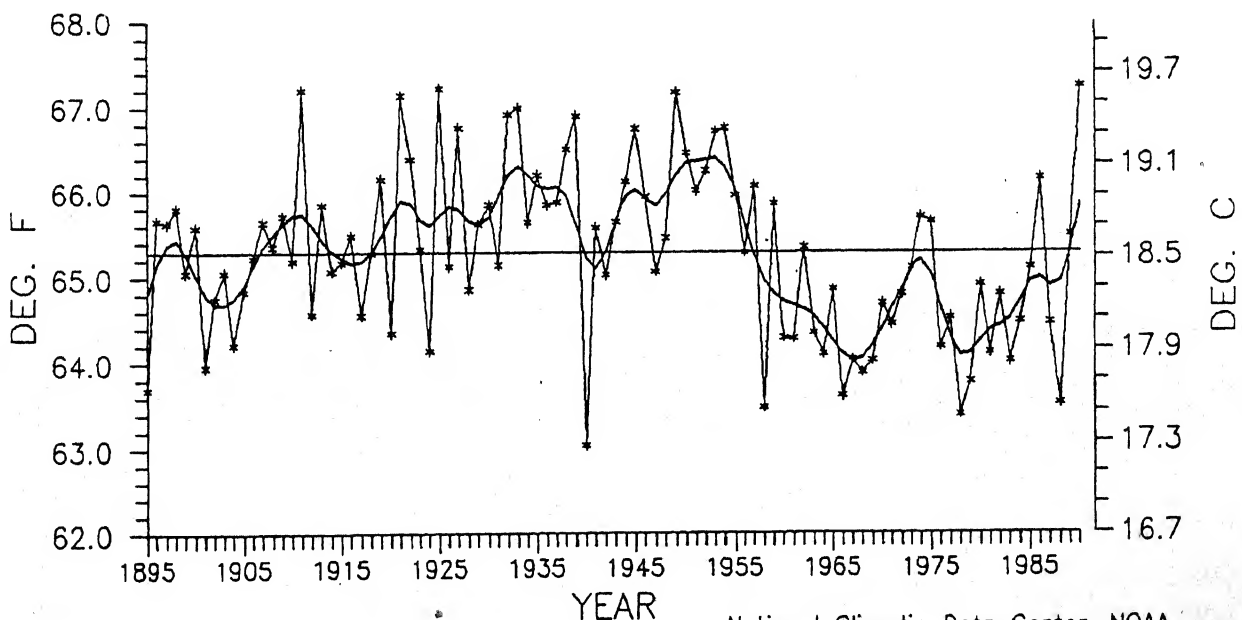
% AREA IN SVR/EXT LONG-TERM DROUGHT



National Climatic Data Center, NOAA

Figure 8. Historical areal percentage of the U.S. in severe ($PDI < -3$) and extreme ($PDI < -4$) long-term drought based upon the Palmer Drought Index (PDI) for October. The percent of the U.S. experiencing extreme wetness or dryness changed little when compared to September, with roughly a fourth of the nation in the severe to extreme drought category, and about a tenth severely to extremely wet. Historically, only 15 other Octobers have had larger drought areas. Current long-term dryness stretches from southern California northeastward into the northern Plains and includes parts of the Southeast.

SOUTHEAST U.S. REGION TEMPERATURE JANUARY-OCTOBER, 1895-1990



National Climatic Data Center, NOAA

Figure 9. Southeast U.S. [FL, GA, AL, SC, NC, VA] regional temperatures January-October, 1895-1990. Although October 1990 temperatures were near the long-term mean nationally, monthly departures were generally between $+2^{\circ}\text{F}$ and $+4^{\circ}\text{F}$ across the Southeast, continuing the region's trend of above normal 1990 temperatures. This has been the warmest start to a year [Jan.-Oct.] in the Southeast since records began in 1895. Other top ten warmest regions included: Northeast [4th], East-North Central and West-North Central [5th], and Northwest [6th].

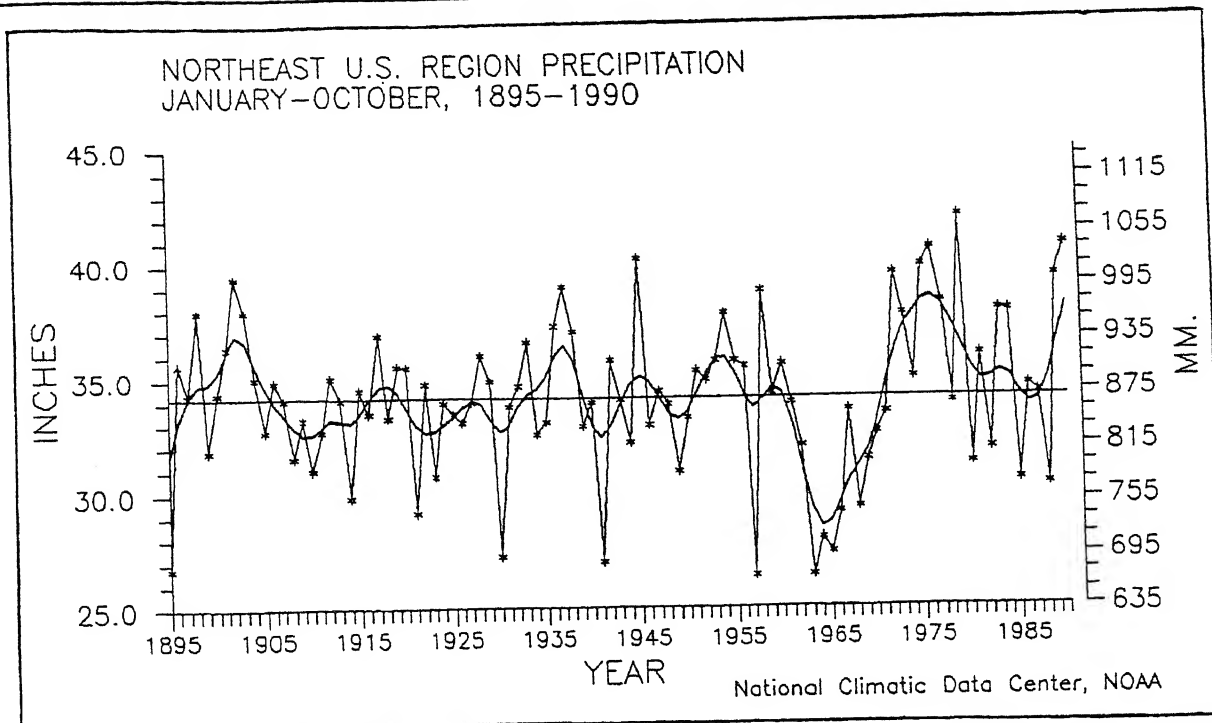


Figure 10. Northeast U.S. [MD, DE, PA, NJ, NY, CT, RI, MA, ME, VT, NH] regional precipitation January-October, 1895-1990. Another month of near-record precipitation (4th wettest October) has contributed to making the first ten months of 1990 as the second wettest such period in the Northeast. Only Jan.-Oct. 1979 was wetter in the region. In addition, the Central region had the fifth wettest such period.

STATISTICS FOR SELECTED RIVER BASINS: PRECIPITATION RANKING FOR OCT 1990, WHERE RANK OF 1 = DRIEST, 95 = WETTEST, BASED ON THE PERIOD 1895 TO 1990; AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) DROUGHT, AND AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) WET CONDITIONS, AS OF OCTOBER 1990. RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER RESOURCES COUNCIL.

<u>RIVER BASIN</u>	<u>PRECIPITATION</u>	<u>% AREA</u>	<u>% AREA</u>
	<u>RANK</u>	<u>DRY</u>	<u>WET</u>
Missouri Basin	28	38.8	.0
Pacific Northwest Basin	75	31.2	3.7
California Basin	20	65.1	.0
Great Basin	26	73.2	.0
Upper Colorado Basin	52	100.0	.0
Lower Colorado Basin	44	14.2	.0
Rio Grande Basin	39	1.6	22.2
Arkansas-White-Red Basin	36	.0	.0
Texas Gulf Coast Basin	40	.0	.0
Souris-Red-Rainy Basin	33	80.1	.0
Upper Mississippi Basin	64	.0	12.7
Lower Mississippi Basin	64	5.5	.0
Great Lakes Basin	92	.0	58.6
Ohio River Basin	89	.0	61.3
Tennessee River Basin	83	.0	.0
New England Basin	96	.0	68.3
Mid-Atlantic Basin	88	.0	27.6
South Atlantic-Gulf Basin	92	12.7	9.7

